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Survey of Farming Skills Required By Secondary School Students in Yam Production in Delta State, Nigeria

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Abstract*: The major purpose of the study was to examine farming skills required by secondary school students in yam production in Delta State, Nigeria. The study adopted descriptive survey research design. The target population consisted of 176 Agricultural science teachers in Delta South and 101 Agricultural prefects in Delta South. The target population of 277 respondents was also the sample. Survey of Farming Skills Required by Secondary School Students in Yam Production Questionnaire (SFSRSSSYPQ) was developed by the researcher for data collection. The instrument was face-validated by two experts in Measurement and Evaluation from the Department of Educational Foundations, Niger Delta University and the supervisor. Cronbach alpha reliability method was used to determine the consistency of the questionnaire items and an overall reliability coefficient of 0.79 was obtained. Four research questions and corresponding hypotheses were raised for the study. Item mean scores were used to analyze the research questions and the Independent t-test statistic was used to test the null hypotheses at .05 level of significance. The findings revealed that, there was no significant difference between the mean responses of agricultural science teachers and agricultural prefects on farming skills required by secondary school students in yam production in Delta State. It was therefore, concluded that, skills in yam production would create employment opportunities and improve the standard of living of citizenry in the state. Based on the findings, the study recommends, among others, that Government should direct the acquisition centres to integrate the identified skills in yam production enterprises into skill acquisition centres for training secondary school students for employment and retraining farmers for success in yam production.*

Keywords: Farming, Skills, Secondary School, Students, Yam and Production

Introduction

Yam is a popular crop in Nigeria and can grow well in all parts of the Country provided adequate water and other environmental conditions are favourable (Federal Ministry of Agriculture and Rural Development, 2018). Yam according to International Institute of Tropical Agriculture (IITA, 2013) is the world second most vital tuber crop after cassava, in terms of production. In addition, yam plays important roles in our local commerce, the African traditional culture, ceremony as well as religion of the people (Izekor, 2010). According (IITA, 2003), Nigeria is responsible possibly for 70 percent production of the global yam need, totaling 17 million tons derived from cultivating 2,837,000 hectares of land. Yam is a vital staple food in Nigeria; it can be roasted, fried, boiled, baked, smoked or pounded into paste (fufu).

Yam as a plant is a member of the genus *Dioscorea* family and produce tubers, bulbils, or rhizomes with economic value. Worldwide, there are well over 600 varieties of yam, meanwhile, only six of these varieties are consumable in the tropics. They are white yam (*Dioscorearotundata*), yellow yam (*D. cayenensis*), water yam (*D. alata*), trifoliate yam (*D. dumentorum*), arial yam (*D. bulbifera*) and Chinese yam (*D. esculenta*) (Idumah, Owombo & Ighodaro, 2014). In West Africa *D. rotundata*, are called white yam or white guinea yam, widely cultivated crop by most yam farmers. It is recorded that in 2012, an estimated 58.7 million tons of yam were produced around the world with over 92 percent of this coming from West Africa (FAOSTAT, 2014). In terms of world supply of yams, 66 percent is attributed to Nigeria and Ghana. Nigeria which is a tropical country is one of the highest producers of yam globally. Recent world data showed that Nigeria supplies about 65% of the total world production; about 38 million metric ton which is cultivated on 2.9 million-ha cultivated area of land in 2012 and valued at 7.75 billion (Odigbo, Ogbidi, & Ewa, 2015).

Yam is considered an important energy stable food in Nigeria as in other parts of the tropics. Additionally, yam serves as source of industrial starch with varying quality and species. It is also not in doubt that the standard of starch contained in some species can favourably compare to starch from cereal (Ajijola, 2014). Yam contain some features within, which enhances its attractiveness, firstly, yam is rich in carbohydrate, starch especially, hence it multiplicity of end use. Secondly, it is preferred by many when compared to other seasonal crops because of its availability in and out of season (Izekor & Olumese, 2010).White yam, water yam, and yellow yam are the popular varieties among the farming households of Delta State. This is as a result of the high adaptability of these yams to the environment and high yield derived from them. Yam possesses a root system that is fibrous, most of which occurs in the top 30cm of the soil. The vine of yam is a rope-like structure and twines around any available support. For white yam, water yam and yellow yam, the direction of twining is to the right while for Chinese yam, Trifoliate yam

and the Aerial yam, the twinning is to the left. Yam leaves are green and heart-shaped and contains no hair (Agbato, 2011). The endowed immense economic value coupled with variety forms to which yam may be prepared and consumed by man necessitate its larger scale production to satisfy the increased demand in time of limited food supply.

Agriculture remains the mainstay of Nigerian economy providing the food need of the teaming population of above 170 million and employing close to 70% of the people who are mostly rural dwellers (FAO, 2013). Yams measure as the ultimate source of earnings and food consumed, and equally measure as a foremost employer of labour in Nigeria (Verter & Bečvařova, 2014). Unemployment (particularly youth unemployment) is a major and worrisome problem for any government. As a means to control and curb unemployment, government need to create jobs and farming is one of the major area to achieve government desire of job creation.

Farming is a complex endeavour and involves many factors and inputs: land, labor, capital and entrepreneur (Dinitrios, Vangelis, Dietrica & Kostas, 2016). Farming could be defined as cultivation of crop and rearing of farm animals for human use. It is the cultivation of the soil for production of crops and rearing of farm animals for human use. Farming goes beyond a means of earning a decent income, it provide jobs, food security and other goods and services for teeming population. Farming, with regard to this study, is the art and science of cultivation of yam for food and other purposes. Kay, in (Mojekwu, 2010) mentioned the various steps involved in yam production as follows: planning, planting, management, harvesting, storing, processing and marketing.

Farm planning is the steps of enumerating production activities to determine how, where and when scarce agricultural resources will be utilized to reduce cost and maximize profit while producing yam. The objectives of farm planning include: maximization of income sustained over a long period of time; improved resource use; and improvement in the standard of living of the farmer (AgriInfo, 2011). The author further outlined the importance of farm planning to include decision making in relation to selection of crops and livestock to be maintained, hectare under different crops and animals, identification of the input and credit needs as well as estimating future cost and returns.

The planting operations are critical for crop establishment so that tubers or minisetts, are placed into the seedbed with adequate soil contact at the appropriate depth to access soil moisture and germinate well. Andres, Adeoluwa and Bhullar (2017), explained that Yams are planted using four main methods, namely: ridges, mounds, holes, and flats. River banks can be used to plant yams if it is not water logged or forest. Planting is usually the process of inserting the propagative part of a crop into the prepared seedbed for germination. Planting, in the view of Hornby (2001), means to put sett/seed in the ground to grow. Agbato (2011) stated that planting is the actual placement of the seed or vegetative materials into the soil. The planting can be either by seed or vegetative parts. Planting of yam is the act of putting yam minisett, yam seed, or the seed yam in the soil to grow. In the opinion of Agbato (2011), yam planting materials are made of tubers. The small tubers are referred to as seed yam while the larger tubers cut into pieces for planting are called setts.

Management is an important organ in crop production including other farming enterprise. Olaitan & Omomia (2009) explained management as the putting together of all factors of production such as land, labour and capital for maximum profit from the farm enterprise. Effective field management operations in yam production required various skills: mulching, staking, weeding, fertilizer application, pests and diseases control.

Harvesting is done by hand using sticks, spades or diggers. Yams can be harvested once (single harvesting) or twice (double harvesting) during the season to obtain a first (early) and second (late) harvest. The harvesting process involves digging around the tuber to loosen it from the soil, lifting it, and cutting from the vine with the corm attached to the tuber. In Nigeria and in Delta State in particular, there is a need to increase the production of this all important crop and it is a way of reducing poverty level of citizens through skill training programme in yam production. Farmer must be skilled to be competent in farming.

Skill as noted by Osinem (2008) is a permanent habit or pattern of doing a thing and it encompass the acquisition of performance ability. To Okorie, cited in David and Okeke (2016), sees skill as a well-established habit of undertaking a task in an acceptable manner by workers within the profession. The author further stated that, it is expertness, practices, capability or competence displayed in carrying out a task. Skill in the view of Wever and Obiyai (2019) is a recurring habit or pattern of doing a task involving the acquisition of performance capabilities in the most economic way. For this study, skills means the abilities required by graduates of secondary school to undertake the different operations involved in yam production with ultimate competence to guarantee the regular supply of its tubers, in order to increase farm profitability. To succeed as a farmer, in the production of yam, farming skills are required.

Farming skills are those abilities required by an individual to enable him performing a variety of different operations in the farm efficiently so as to generate maximum output. In this study settings, farming skills are those competency required by secondary school students to perform different tasks in yam production to enhance food security and generate income. Farming skills in the secondary school is taught through Agricultural Science.

In Delta State, Agricultural Science is learnt by the students to equip them with basic production skills in crop found in their environment. Agricultural Science remains a major subject taught in the vocational curricular, at the junior and senior secondary schools in Delta State. The subject is planned to inculcate the necessary skills required in agricultural practice for effective citizenship and also help in the national sustainability of food security. Agricultural science teacher in the view of Olaitan, Asogwa and Assouzu (2010) is that person trained in the instructional and technical parts of the subject (Agricultural science) and is engaged with the task or role of instilling in the students the knowledge, skills and attitudes. The teacher of Agricultural science in the study settings is a person who has being trained and groom in knowledge, skills, attitude and pedagogy from a recognized tertiary institution and vested with the role of imparting same to learners, prepare and expose students for occupation.

Attainment of the goals and objectives of agricultural science depends on effectiveness of teaching and learning going on. The aims, according to Egbule (2004), include but not limited to the followings; to:

I. stimulate students' interest in Agriculture;
II. help students to possess needed knowledge of Agriculture;
III. develop basic Agricultural skills in students;
IV. help students to combine knowledge with skills in Agriculture;
V. open opportunities to students in the Agricultural field;
VI. keep students ready for higher studies in Agriculture; and
VII. keep students ready for job in the Agricultural sector.

The researcher observed that the teaching of Agricultural science subject at basic and secondary school has failed to transform or change the people and the nation proportionately. Farming is known to require training and not just education; there is the need for students offering agricultural science and related courses to acquire on-the-farm practical knowledge that will be applicable to their works after graduation. The researcher also observed that, most of the secondary school students lack basic production skills which could assist them to succeed in skilled agricultural programmes like yam production enterprise and as such students graduate from school and still lack basic skills that would enhance their functionality in today's society. Hence many of the students, who could not obtain admission into higher institutions or find satisfying job within their environment, are idle and totally dependent on their parent. It was based on this background that it became necessary to identify farming skills required by secondary students in yam production in Delta State.

Statement of the Problem

In Delta State, many farmers engage in yam production due to the favorable condition of the area. Farmers in Delta State grow yam as one of the major stable crop. It is observed, however, that they engage in the traditional methods of yam production. The traditional methods involve the use of hoe heaping, planting of yam as inter crop and the practice of shifting cultivation without the use of any fertilizer. Traditionally, farmers use tubers as seeds, which is inefficient and costly. High production costs are attributed to the use of seed yam tubers, which account for about 30% of the total yield. Moreover, most of the tubers are of low quality, containing pests (nematodes) and pathogens (virus) which decrease the yield of yam tubers. Also, the processing of yam involves grinding it with local machines and sieving with constructed wire gauze sieve.

The yam tubers are processed into flour, flakes or roasted yam. These products are sold to generate income by those in the business. There are opportunities for any person to enter into yam production enterprise which result to huge profits making. In Delta State, the researcher had observed that secondary school graduates who are mostly youths who could not further their education, lack basic production skills which could help them to succeed in skilled agricultural programmes like yam production enterprise. They rather prefer to travel to the cities in search of white collar jobs that are uncertain. The inability of these young adults to find jobs propelled them into social vices such as stealing, prostitution, fighting, drug abuse, fraud among others. Most of these idle youths involve themselves in illegal activities like kidnapping, stealing among others, due to idleness from unemployment. It is in furtherance of the above that necessitated this study. The study therefore, sought to identify farming skills required by secondary school students for success in yam production in Delta State.

Purpose of the Study

The major purpose of this study was to investigate farming skills required by secondary school students in yam production in Delta State. Specifically, the study sought to:

1. ascertain farming skills required by secondary school students in planning for yam production in Delta State;
2. examine farming skills required by secondary school students in planting yam in Delta State;
3. find out farming skills required by secondary school students in the management of yam farm in Delta State; and
4. determine farming skills required by secondary school students in harvesting yam.

Research Questions

The following research questions guided the study:

1. What are the farming skills required by secondary school students in planning for yam production in Delta State?

2. What are the farming skills required by secondary school students in planting yam in Delta State?
3. What are the farming skills required by secondary school students in the management of yam farm in Delta State?
4. What are the farming skills required by secondary school students in harvesting yam in Delta State?

Hypotheses

The following null hypotheses formulated were tested at 0.05 alpha level.

H_{O1}: There is no significant difference between the mean responses of agricultural science teachers and agricultural prefects on farming skills required by secondary school students in planning for yam production.

H_{O2}: There is no significant difference between the mean responses of agricultural science teachers and agricultural prefects on farming skills required by secondary school students in planting yam.

H_{O3}: There is no significant difference between the mean responses of agricultural science teachers and agricultural prefects on farming skills required by secondary school students in the management of yam farm.

H_{O4}: There is no significant difference between the mean responses of agricultural science teachers and agricultural prefect son farming skills required by secondary school students in harvesting yam.

Methodology

The study was conducted with the use of descriptive survey research design. The population of the study comprised all the agricultural science teachers and agricultural prefects in public secondary schools in Delta South. There are 176 agricultural science teachers and 101 agricultural prefects in public school in Delta South, respectively; totaling 277 respondents. The population is a manageable size, hence the census study was adopted. The instrument used for the study was a self-designed questionnaire titled" Survey of Farming Skills Required by Secondary School Students in Yam Production Questionnaire" (SFSRSSSYPQ) consisting of 33 items. The questionnaire is made up of two sections, namely section A and B. Section A solicits information on personnel data of the respondents, and section B with 33items was divided into four (4) sub-headings in line with the 4 objectives. They include planning for yam production 8 items, planting 10 items, management of yam farm 8 items and harvesting yam 7 item, respectively. The instrument was face-validated by two experts in Measurement and Evaluation from the Department of Educational Foundations, Niger Delta University, Nigeria. Cronbach alpha reliability method was used to determine the consistency of the questionnaire items and an overall reliability coefficient of 0.79 was obtained. Four research questions and corresponding hypotheses were raised for the study. Out of the 277 questionnaire distributed, 246 (159 Agricultural science teachers and 87 Agricultural prefects) were retrieved and analyzed, representing 89% rate of return. The mean and standard deviation were used to analyze the research questions. Acceptable criteria of 2.5 and above were adjudged, "agree" while items below the cut-off point of 2.5 were rejected. The Independent t-test statistic was used to test the null hypotheses at .05 level of significance.

Table 1: **Mean and standard deviation scores of respondents on farming skills in planning for yam production.**

S/N	Item Statement	Agric. Science teachers N_1 =159		Agric. prefects N_2 = 87		Decision
		$\bar{\chi}_1$	SD_1	$\bar{\chi}_2$	SD_2	
1	Draw up programme plan for yam production.	3.02	0.97	3.03	0.96	Agree
2	Formulate specific objectives for the farm.	2.99	0.95	3.03	0.92	Agree
3	Budget for the management practices.	2.97	0.88	2.86	0.95	Agree
4	Identify suitable soil for yam production.	3.02	0.92	2.90	0.91	Agree
5	Identify relevant inputs and their location for yam production.	3.11	0.89	3.06	0.98	Agree
6	Plan relevant tools and equipment for use in yam production.	2.91	0.91	2.98	0.93	Agree
7	Identify sources of fund.	2.87	1.02	3.09	0.90	Agree
8	Review the objectives periodically based on changes in the business.	2.80	0.90	3.18	0.88	Agree
	Grand Mean and Standard Deviation	**2.96**	**0.93**	**3.02**	**0.93**	**Agree**

Data presented in Table 1 shows the mean and standard deviation of Agricultural science teachers and Agricultural prefects on farming skills required by secondary school students in planning for yam. The Table revealed that all the eight (8) items had their mean ($\bar{\chi}$) values ranging from 2.80 to 3.18 and were all above the cut-off point of 2.50. On the whole, the grand mean score of 2.96 and 3.02 was also greater than the cut-off mean score of 2.50 with the standard deviation score of 0.93. This implied that all the respondents agreed that the eight (8) statements were farming skills required by secondary school students for planning for yam production.

Research Question Two

What are the farming skills required by secondary school students in planting yam in Delta State?

Table 2: Mean and standard deviation scores of respondents on farming skills in yam planting

S/N	Item Statement	Agric. Science teachers N_1 =159		Agric. prefects N_2 = 87		Decision
		$\bar{\chi}_1$	SD_1	$\bar{\chi}_2$	SD_2	
9	Clear the land with appropriate tools or implements.	3.04	0.95	3.00	0.90	Agree
10	De-stump the cleared land.	3.08	0.93	3.13	0.85	Agree
11	Conduct Seed viability test by nursing yam setts under shade	3.02	0.93	2.99	0.90	Agree
12	Apply green manure.	3.03	0.92	3.02	0.99	Agree
13	Construct ridges or heaps of about 1m x 1m in diameter.	3.04	0.96	3.01	0.98	Agree
14	Fumigate the soil for effective prevention of diseases.	2.97	0.98	3.07	0.91	Agree
15	Cut large tubers into setts for planting.	2.94	0.98	3.01	0.92	Agree
16	Make a hole on the mound or ridges of about 12-18cm depth.	2.92	1.02	2.93	1.02	Agree
17	Place the planting material in slanting form at an angle of 45 degree to enhance sprouting.	3.00	0.99	3.02	1.05	Agree
18	Cover hole with light soil.	2.91	0.94	3.09	0.82	Agree
	Grand Mean and Standard Deviation	**2.99**	**0.96**	**3.03**	**0.93**	**Agree**

Data presented in Table 2 shows the mean and standard deviation of Agricultural science teachers and Agricultural prefects on farming skills required by secondary school students in planting yam in Delta State. The Table revealed that all the ten (10) items had their mean ($\bar{\chi}$) values ranging from 2.91 to 3.13 and were all above the cut-off point of 2.50. On the whole, the grand mean score of 2.99 and 3.03 was also greater than the cut-off mean score of 2.50 with the standard deviation score of 0.96 and 0.93. This implied that all the respondents agreed that the ten (10) statements were farming skills required by secondary school students in planting yam in Delta State.

Research Question Three

What are the farming skills required by secondary school students in the management of yam farm in Delta State?

Table 3: Mean and standard deviation scores of respondents on farming skills in the management of yam farm

S/N	Item Statement	Agric. Science teachers N_1 =159		Agric. Prefects N_2 = 87		Decision
		$\bar{\chi}_1$	SD_1	$\bar{\chi}_2$	SD_2	
19	Select best mulch materials to mulch the mounds or ridges.	3.01	0.96	3.13	1.16	Agree

20	Water in the morning or evening especially during the dry spell.	3.03	0.98	2.99	0.97	Agree
21	Supply (replace) setts that fail to sprout.	3.02	0.93	2.99	0.90	Agree
22	Select strong long sticks to stake the twine from right to left orientation.	2.97	0.99	3.17	0.82	Agree
23	Weed the yam farm 2-3 months after planting with weeding cutlass, or using the hand-held hoe.	2.96	1.00	3.13	0.91	Agree
24	Application of fertilizer in a ring of about 15cm radius around the yam plant if mounds or holes are used.	2.87	1.03	3.08	0.82	Agree
25	Apply Thiodan 5% to Prevent and control insect pests.	2.93	0.98	3.03	0.96	Agree
26	Enhancing tuberization from the 3rd months of planting.	2.97	0.97	3.11	0.98	Agree
	Grand Mean and Standard Deviation	**2.97**	**0.98**	**3.08**	**0.94**	**Agree**

Data presented in Table 3 shows the mean and standard deviation of Agricultural science teachers and Agricultural prefects on farming skills required by secondary school students in management of yam farm in Delta State. The Table revealed that all the eight (8) items had their mean ($\bar{\chi}$) values ranging from 2.87 to 3.13 and were all above the cut-off point of 2.50. On the whole, the grand mean score of 2.97 and 3.08 was also greater than the cut-off mean score of 2.50 with the standard deviation score of 0.98 and 0.94. This implied that all the respondents agreed that the eight (8) statements were farming skills required by secondary school students in management of yam farm in Delta State.

Research Question Four

What are the farming skills required by secondary school students in the harvesting of yam in Delta State?

Table 4: Mean and standard deviation scores of respondents on farming skills in the harvesting of yam

S/N	Item Statement	Agric Science teachers N_1 =159		Agric. prefects N_2 = 87		Decision
		$\bar{\chi}1$	SD	$\bar{\chi}$ 2	SD	
27	Check maturity within 180-270 days and yellowish of the leaves.	2.93	0.94	3.17	0.94	Agree
28	Open the soil around mounds and ridges with a digging instrument and pull the tuber gently.	2.75	1.08	2.98	0.94	Agree
29	Leave the head to produce a second tuber that will be harvested later.	2.98	1.00	3.15	0.84	Agree
30	Replace the soil around the base of the yam.	2.98	0.96	3.00	1.02	Agree
31	Remove debris from the tubers	2.78	0.97	2.85	0.86	Agree
32	Sorting the tubers based on size, texture.	2.76	1.03	2.98	0.95	Agree
33	Grading the tubers based on varieties (quality).	2.99	1.02	2.90	0.95	Agree
	Grand Mean and Standard Deviation	**2.88**	**1.00**	**3.00**	**0.93**	

Data presented in Table 4 show the mean and standard deviation of Agricultural science teachers and Agricultural prefects on farming skills required by secondary school students in harvesting yam in Delta State. The Table revealed

that all the seven (7) items had their mean ($\bar{\chi}$) values ranging from 2.75 to 3.17 and were all above the cut-off point of 2.50. On the whole, the grand mean score of 2.88 and 3.00 was also greater than the cut-off mean score of 2.50 with the standard deviation score of 1.00 and 0.93. This implied that all the respondents agreed that the seven (7) statements were farming skills required by secondary school students in harvesting of yam in Delta State.

Testing of Hypotheses

HO_1: There is no significant difference in the mean responses of agricultural science teachers and agricultural prefects on farming skills required by secondary school students in planning for yam production.

Table 5: t-test Analysis of respondents on farming skills in planning for yam production

Group	N	Mean	SD	Df	t-cal	t-table	Decision P >0.05
Agricultural Science teachers	159	2.96	0.93	244	-0.484	1.960	Not Significant
Agricultural prefects	87	3.02	0.93				

Key: SD = Standard Deviation, Df = Degree of freedom, Not Significant, p> 0.05

The data presented in Table 5 indicates that t-test analysis is not significant at 0.05 alpha level because the calculated t-value -0-484 is less than the tabulated t-value 0f 1.96 with 244 degree of freedom. Therefore, the null hypothesis stating no significant difference in the mean ratings of agricultural science teachers and agricultural prefects on the farming skills required by secondary school students in planing for yam production was upheld.

HO_2: There is no significant difference between the mean responses of agricultural science and agricultural prefects on farming skills required by secondary school students in planting yam.

Table 6: t-test Analysis of respondents on farming skills in planting yam

Group	N	Mean	SD	Df	t-cal	t-table	Decision P >0.05
Agricultural Science teachers	159	2.99	0.96	244	-0.319	1.960	Not Significant
Agricultural prefects	87	3.03	0.93				

Key: SD = Standard Deviation, Df = Degree of freedom, Not Significant, p> 0.05

The data presented in Table 6 shows that, the calculated t-value -0.319 is less than the tabulated t-value 0f 1.96 at 0.05 alpha level with 244 degree of freedom. This implied that there was no significant difference in the mean ratings of agricultural science teacher and agricultural prefects on the farming skills required by secondary school students on planting yam. Therefore, the postulated null hypothsis stating no significant difference was upheld.

HO3: There is no significant difference between the mean responses of agricultural science teachers and agricultural prefects on farming skills required by secondary school students in the management of yam farm.

Table 4 .2.4: t-test Analysis of respondents on farming skills in management of yam

Group	N	Mean	SD	Df	t-cal	t-table	Decision P >0.05
Agricultural Science teacher	159	2.97	0.98	244	-0.864	1.960	Not Significant
Agricultural prefects	87	3.08	0.94				

Key: SD = Standard Deviation, Df = Degree of freedom, Not Significant, p> 0.05

The data presented in table 7 shows that, the calculated t-value -0.864 is less than the tabulated t-value 0f 1.96 at 0.05 alpha level with 244 degree of freedom. Therefore, the null hypothesis stating no significant difference in the mean ratings of agricultural science teachers and agricultural prefects on the farming skills required by secondary school management of yam farm was upheld.

HO4: There is no significant difference between the mean responses of agricultural science teachers and agricultural prefects on farming skills required by secondary school students in harvesting yam.

Table 8: t-test Analysis of respondents on farming skills in harvesting yam

Group	N	Mean	SD	Df	t-cal	t-table	Decision P >0.05
Agricultural Science teachers	159	2.88	1.00	244	-0.942	1.960	Not Significant
Agricultural prefects	87	3.00	0.93				

Key: SD = Standard Deviation, Df = Degree of freedom, Not Significant, p> 0.05

The data presented in Table 8 revealed that the calculated t-value of -0.942 is less than the critical table value of 1.960 at 0.05 alpha level with 244 degree of freedom. Therefore, the null hypothesis stating no significant difference in the mean responses of agricultural science teachers and agricultural prefects on farming skills required by secondary school students in harvesting yam was upheld.

Discussion of the Findings

Findings on planning revealed that the eight identified farming skills were required by secondary school students for planning for yam production. It was also found that agricultural science teachers and agricultural prefects have no significant different views on farming skills required by secondary school students in planning for yam production. The findings of this study is in agreement with the works of Mojekwu (2010), who carried out a study on work skills required by secondary school graduates for success in yam production and processing enterprise in Anambra State. The study found that nine (9) skills were required in planning for yam production. They include: formulate objectives for yam production, planning for the procurement of farm inputs and planning the farm around the existing special market and land productivity. This findings is also in agreement with the views of Sastry, in Maduka (2016) who stated that Farm planning enables the farmer to achieve his objectives of profit maximization and/ or cost minimization in a more organized manner.

Findings on planting revealed that the ten (10) identified Farming skills were required by secondary school students for planting yam. It was also found that agricultural science teachers and agricultural prefects had no significant different views on farming skills required by secondary school students in planting yam. The findings of this study is in tandem with the report of Agbo, Agbulu, and Ekele (2016) who identify planting skills to include: deciding what type of sett to plant (whole tubers or tuber pieces); subdivision of large tubers into smaller pieces (heads, middles and tails). selection of setts that weight 150-300g for planting; cut large tuber and cure setts 1-2 days before planting; planting of yam about 1m x 1m apart. Alawa, Abanyam and Okeme (2010), and Alawa and Okeke (2015) identified some skills for planting yam to include, selecting of yam species to be planted, making hole on mounds or ridges about 12 – 18 cm depth and covering the hole with sand after inserting the sett. This finding is consistent with the works of Agbato (2011), who stated that planting yam is done by opening up the top of the mounds or ridge to a depth of about 12 -18cm. The author advised that when planting cut portions, the cut surfaces must be placed upwards while the buds face downwards.

Findings on management of yam farm revealed that the eight (8) identified farming skills were required by secondary school students for management of yam farm. It was also found that agricultural science teachers and agricultural prefects had no significant different views on farming skills required by secondary school students in management of yam in Delta State. The finding of this study agreed with the works of Agbo, Agbulu, and Ekele (2016) who reported that skills required in yam maintenance in the field include: select suitable mulch materials that are free from weed seeds or vegetative propagated weeds; source mulch material that do not harbor termites or prone to termite attack; place mulch over the spots where setts have been planted; secure the mulch in place to prevent it from being blown away by wind determining the appropriate vine length at which to begin staking; determining the height of stake (2 m tall) that is adequate; determine the suitability of a stake in terms of withstanding of break age or dislodging as a result of wind or weight of foliage; determine the most critical time of weeding etc.

Findings on harvesting revealed that the seven (7) identified farming skills were required by secondary school students for harvesting yam. It was also found that agricultural science teachers and agricultural prefects had no significant different views on farming skills required by secondary school students in yam harvesting. The findings of this study is in agreement with Agbo, Ekele, and Amonjenu, (2016) who conducted a study on evaluation of harvest and post-harvest skills possessed by Agricultural Education students in yam (*Dioscorea species*) production in Colleges of Education in North Central Nigeria. The authors identify seven skills in harvesting of yam to include: judge the maturity of tubers that are marketed; recognize the onset of senescence (i.e. large scale leaf yellowing and drying of vines as a result of maturation); time first harvest with respect to the yield of the second harvest.; dig around the tuber to free it from the soil without dislodging or damaging the roots (first harvesting); severe tuber from the plant just below its attachment to the corm. ; replace soil over the roots (first harvest) and lift up tubers from the soil without bruising or breaking them. The findings of this study is also in agreement with the finding of Andres *et al*. (2017), who corroborated that yams mature 7–9 months after planting and this can be indicated by the

yellowing of the leaves and natural dieback of the vines. In order to maximize yield, harvesting must be done when the yam reaches full maturity and before the soil becomes too dry. After removing the vines, hand tools are used to carefully dig out the tubers taking care not to damage them. In the same vein, FMARD (2018), averred that care should be taken during harvesting to minimize damage to tubers that lead to rot and decrease in market value.

Conclusion

The issue of unemployment and employment of skilled work force has been of primary concern to Nigerians and Delta State in particular. This has necessitated studies to determine the farming skills requirements for secondary school graduates in yam production. The acquisition of skills in yam production by the secondary school graduates which are mostly youth could help to contribute to food security, eradicate poverty and youth unemployment in the society. When the youths are gainfully employed and self-reliant, they cannot be used or manipulated by greedy politicians to perpetuate violence in the society or be involved in acts of terrorism, kidnapping, armed robbery, ethnic and religious conflicts. The study therefore identified farming skills in the areas of planning, organizing, planting, management of yam farm, and harvesting operations required by secondary school students in yam production. If the findings of this study are therefore, developed into a training manual and packaged for students, teachers, extension agents, the Ministry of Agriculture and Natural Resources, it will equip the youths in yam production skills and create employment opportunities and ultimately; improve the standard of living of the citizenry in the State.

Recommendations

Based on the findings of the study, the following recommendations were made:

1. Agricultural science teacher should use these findings of this study to teach students in the schools and colleges or for preparing youths for employment in the field of agriculture.
2. All the skills identified in the study for planning yam production should be packaged into training manuals for training youth in order to provide them with knowledge, skills, attitude needed in yam production through the skill acquisition centre. This could go a long way in sustaining them financially.
3. The extension agents should utilize the identified skills for organizing farm input should be packaged into training manuals for retraining farmers for competency on the job.
4. Delta State government should request skill acquisition centres, to package the identified skill for planting yam in the study, for training youth in yam production enterprise.
5. Young farmers' should utilize the identified skills for management and harvesting of yam to improve their production practices and earn higher income in yam production.

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