International Journal of Vocational and Technical Education Research
Vol.5, No.5, pp.1-10, September 2019
Published by European Centre for Research Training and Development UK (www.eajournals.org)

VOCATIONAL EDUCATION NEEDS OF CUCUMBER FARMERS FOR ENHANCING PRODUCTIVITY IN IKWERRE LOCAL GOVERNMENT AREAS OF RIVERS STATE

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ABSTRACT: *This study examined the vocational education needs of cucumber farmers for enhancing productivity in Ikwerre local government areas of Rivers State. The population of the study comprised of 108 registered cucumber farmers in the study area. The study adopted a census study as the entire population was used. Three research questions were formulated to guide the study. Data were collected using well validated and structured questionnaire and interview. The reliability coefficient (r) of 0.81 was established using test-retest method. Data were analyzed descriptively using Mean and Standard Deviation with criterion mean value of 2.50 and above, while z-test was used to test the hypotheses at 0.05 level of significance. The findings showed that farmers need vocational education for good knowledge in selection of site, mulching techniques, identify good seed variety and determine the need for soil treatment among others. The study also showed that cucumber farmers need vocational education to be skillful on the removal of old and diseased cucumber plants from the field, apply foliar herbicides to control disease infections. Based on the findings the study recommended that Rivers State government should direct the vocational education centers to integrate the identified skills in commercial cucumber production enterprises into skill acquisition centers for training youths for employment and retraining farmers for competency on the job. Cucumber farmers in Ikwerre Local Government Area of Rivers State should also be encouraged and motivated to enroll into Vocational Education centers in the state to learn the skills needed in commercial cucumber production for sustainable living*.

KEY WORDS: vocational education, needs, farming, cucumber, productivity

INTRODUCTION

Education is generally viewed as an innovative process, which improved individuals' skills, knowledge, habits and attitude in the society. The search for appropriate skills and competencies ends with training. Hence Vocational education is an aspect of education that leads to the acquisition of practical and applied skills, as well as basic scientific knowledge (National Policy on Education, 2004). The NPE (2004) also pointed out that vocational education leads individual directly to a particular function in a society; which is to be employed in job trade or private occupations. Vocational education is any form of education designed to imbue the individual with the right type of knowledge, skill, competencies and attitudes for specific occupations (Nwankwo, 2000).

Vocational agricultural education is also concerned with the development of skills; knowledge and attitude in the field of agriculture to enable the recipients take up a career in it (Ezeagu and Ezema, 2004). It is meant to prepare individuals in various agricultural occupations such as growing crops,

Print ISSN: ISSN 2059-1187, Online ISSN: ISSN 2059-1195

rearing animals, providing ornamental horticulture, managing farm business and farm resources (Ezeagu and Ezema, 2004). However, among the rural communities, such occupations are practiced at subsistence level among peasant farmers, just to feed the family and raise a little income from excess production (Deekor, 2017). This group of farmers therefore needs special education through vocational training to enhance their productivity and generate more income for their own good and that of the society.

Cucumber (*Cucumis sativus*) is a member of the *Cucurbitaceae* family. It is a native of Asia and Africa, where it has been consumed for over 3,000 years (Valenzuela, Hamasaki and Fukuda, 2011). Cucumber production is very popular in many areas of Africa and other parts of the world. This is because; its production is highly favoured by warm season. For instance, Hochmuth (2009) affirmed that cucumber is a warm season crop that requires plenty of sunlight for maximum production. In addition, Schrader, Aguiar and Mayberry (2002) stated that cucumber is a very tender, warm-season plants that grow best in minimum temperature of 15.60^{o}C and a maximum temperature of 32.20^{o}C. In fact, low temperature below 15.60^{o}C reduces germination rate of cucumber seeds (Valenzuela, *et al,* 2011). It is an annual deep-rooted crop with tendrils and hairy leaves. Cucumbers are often eaten as a vegetable, but they are scientifically considered a fruit as they contain enclosed seeds and develop from a flower. Cucumbers, like cantaloupes, squash, pumpkins and watermelons, are members of the cucurbit family of produce. They are vine crops and can be grown on the ground or on poles or trellises to suspend the fruit. According to Ogbodo, Okorie and Utobo (2010), cucumbers come in three distinct types: seedless, seeded, and mini. There are close to 100 varieties, but common ones include the English, garden, Persian, mini, and lemon. The English cucumber is the longest, is narrow, and is often marketed in a plastic wrap. The skin is thin and often does not require peeling. In contrast, the garden cucumber has a dark waxy skin. The skin is normally removed by consumers because of its bitter taste. Persian cucumbers are called burbles because they tend to be smaller, sweeter, and seedless. The skin is smoother, thinner, and, similar to the English variety and does not require peeling. These cucumbers tend to be milder and easier on the digestive system. Kirby cucumbers are the smallest. These mini cucumbers are becoming popular in the market due to consumer preferences. They have a wide variety of skin colors ranging from yellow to dark green. Lemon cucumbers are round and yellow, resembling lemons, but they are sweet, have thin skins, and contain seeds. There are three distinct uses for cucumbers in the market: fresh whole, fresh sliced, and pickled. Whether it is the English, garden, Persian, mini, or lemon variety, fresh whole cucumbers are grown for consumer retail sales. Fresh sliced cucumbers are typically garden variety and are grown for the food service sector, which requires uniform sized slices for packaged salads and restaurant chain salad bars. Pickling cucumbers tend to be smaller and thicker. The best known variety is the bumpy skinned gherkin.

The nutritional significance of cucumber is overwhelming. Valenzuela, *et al,* (2011) reported that cucumber is a popular fresh market vegetable in salads and is also processed into other useful food products. Stern (2009) observed that cucumber provides vitamin C, vitamin B, beta carotene, calcium, phosphorus, iron, sodium, potassium, and zinc. It has the advantage of being relatively low in calories and high in nutrients and an excellent source of the fibre needed for a healthy digestive system (Stern, 2009). Economically, vegetables such as cucumber occupy a central role in world agriculture.

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Statement of the Problem

Some decades ago, cucumber was not very popular as a vegetable or fruit among the southern people of Nigeria. However, the agricultural products found its way into our market mainly from the north and the demand for it became visible. The increase in demand could stern from the awareness of the nutritive and medicinal values of the vegetable. Onyeozu et al (2016) stated that cucumber is good for diabetic patients as it contains low sugar and speeds up digestion. Therefore, it is expected that with the favourable environmental factors, rural farmers should have capitalized on the high demand for the product and increased their production capacity. Yet bulk of the product is still being transported from the northern states depriving the local farmers of the advantage of increased income from farming. The question now is, are the farmers challenged by lack of education on cucumber production? In what area(s) of production activities do they lack such knowledge? Answer to these questions makes a study of this nature necessary.

Purpose of the Study

The purpose of this study therefore, was to identify vocational education needs of cucumber farmers in Ikwerre Local Government Area. Specifically, the objectives of the study include:

1. Identify the vocational education needs of cucumber farmers in pre-planting and planting operations for enhancing productivity in Ikwerre Local Government Areas.
2. Determine the vocational education needs of cucumber farmers in post-planting operations for enhancing productivity in Ikwerre Local Government Areas.
3. Identify the vocational education needs of cucumber farmers for harvesting, packaging and marketing operations for enhancing productivity in Ikwerre Local Government Areas.

Research Questions

In line with the three specific purposes of the study, the following three research questions were raised:

1. What are the vocational education needs of cucumber farmers in pre-planting and planting operations for enhancing productivity in Ikwerre Local Government Areas?
2. What are the vocational education needs of cucumber farmers for post-planting operations for enhancing productivity in Ikwerre Local Government Areas?
3. What are the vocational education needs of cucumber farmers for harvesting, packaging and marketing operation for enhancing productivity in Ikwerre Local Government Areas?

REVIEW OF LITERATURE

Planting operation and educational needs of cucumber farmers

Vocational education in agriculture permits and encourages the provision and development of mechanical equipment of agricultural production. According to Stern (2009), vocational education in agriculture enables farmers have access to plough, harrow and other equipments required for large cultivation of land. Farmers need vocational education in agriculture as a way of acquiring knowledge and necessary skills in agriculture (Ogbodo, et al 2010). According to Osinem and Nwoji (2005), the transformation of cucumber farming in Nigeria to a more productive form of agriculture requires the development of agricultural education, training, research and extension service programmes.

Print ISSN: ISSN 2059-1187, Online ISSN: ISSN 2059-1195

The knowledge acquired from agricultural education could be used by cucumber farmers in the formulation of inorganic manure and its application to make the soil rich (Hochmuth 2009). In the same vein, Schrader, et al (2002) stated that vocational programmes such as school to land and Operation Feed the Nation (OFN) are vehicles for bringing innovation to crop farmers on practices to boost the richness of soil for production. Most especially, they educate the farmers on how to apply new technologies in cucumber production to increase yield.

According to Hardy and Rowell (2002), vocational education in agriculture enables crop farmers to read and understand instruction on the application of inputs, such as seeds propagation, fertilizer application, pesticides and the calculation of right proportion of inputs to combine to get desired results. Osinem and Nwoji (2005) opined that the skills needed by cucumber farmers includes; Sowing and transplanting techniques, such as when to sow and the spacing distance and pruning the vines over the trellis for maximum yield. According to Hardy and Rowell (2002) studies have shown that cucumber appropriately spaced and staked show enormous disparity and difference with the both unstaked and unspaced, as a result of avoiding competition, overcrowding and correct exposure or positioning of cucumber leaves to sunlight for effective photosynthetic activities, that will enhance fruit yield. Elsewhere, staking of cucumber has been found to help optimize yields for harvest of pickling cucumber. Higher fruit yield was observed on trellis treatment than for the non-trellised treatment. Nelson, (2005) reported increases in fruit yield as plant density increased.

Post-Planting Operations and Vocational Education needs of farmers

To protect the fruit from frost and to control temperatures in the early and late season, cucumbers can be grown under plastic row covers. The covers can later be dropped and converted into windbreaks to protect the plants from foot traffic and wind damage. Weed and pest control are also important management practices to ensure optimum production. Weed control in cucumber production is accomplished through a variety of methods including use of cover crops and mulches, cultivation and hand weeding, and applications of herbicides targeting the specific types of common weeds in a particular field.

Cucumber plants are susceptible to a variety of insect, bacterial, fungal, and nematode infections. Therefore they need vocational education to identify such infections or infestations (Deekor, 2017). Early identification of such infections or infestations is key to appropriate and rapid control methods. Disease prevention strategies include crop rotation, careful field selection, sanitation, soil treatments, and appropriate seed selections. It is a common practice to utilize soil mulches for controlling weeds and protecting from insects as well as modifying soil temperatures, conserving water, and for controlling erosion. Mulches can include peat moss or other organic material. Many commercial operations use plastic covering as a mulch to protect crops. Depending on the effect desired, producers can employ colors such as clear, black, white, or aluminum. These colors all have a warming effect on the soil in the evening, but can warm, cool, or have no effect during the daytime (Deekor, 2017).

Irrigation is another post-planting operation that its knowledge and skills are necessary for increased productivity. This could be accomplished either through flooding furrows or direct drip lines laid along the planted rows (Hochmuth, 2009). Cucumbers require frequent irrigation during

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the growing period. Too little moisture will affect fruit shape whereas water soaked fields can lead to mildew and other disease problems. Determining the need for fertilization of cucumber growing areas is generally made through both soil nutrient analysis (typically done at least four months before planting) and plant tissue nutrient analysis. For plant tissue analysis, growing leaves are sampled and analyzed for macro and micronutrient content. Depending on results of these analyses, needs for fertilization to provide macronutrients such as nitrogen, phosphorus, potassium, calcium, magnesium, and sulfur are determined.

Farmers normally plant from 40,000 to 90,000 plants per acre. Some Farmers plant as much as 150,000 per acre. Although most cucumbers are picked by hand, the larger operations are mechanically harvested. Deekor, (2017) stated that the time from planting to harvest can be relatively quick in as few as 36 to 40 days from planting depending on variety and weather conditions. Therefore, the ability to understand this phenomenon and timing requires the education of farmers in these areas.

Pruning

Generally, the local cucumber has main vine, second vine and third side vine. The main vine should be pruned at 5-6 leaves stage, and keep the second vine. Local varieties have fruiting on the second vines. The third side vine has to be pruned if no fruiting. Likewise, old and disease infected leaves, over ripe fruits needs to be removed time to time. During summer season, the main shoot of cucumber should be trimmed when the vine gets 4-5 leaves so that the new stem shoots that grow in vine and it will give more and better yields.

Harvesting and Vocational Education needs of farmers

Cucumbers are generally harvested from 70 to 80 days after sowing. Normally, the cucumber is ready to harvest after 15-20 days of female flower setting. The harvest should be done in the early morning as fruits temperature is low. As a result, the fruits can be kept fresh for few days. But, it should not be kept out side. When fruits grow very large, it gives pretty seed. Cucumbers grow very fast, sometimes it seems like they grow overnight. The plants should be checked daily for mature cucumbers (Adeyeton, 2006).

Also, Olaintan (2004) stated that cucumbers are harvested at a variety of stages, from quite young to mature before seeds reach final maturity and harden. Those that are harvested prior to maturation of seeds are marketed as seedless. Fruit is harvested when uniform length, shape, and diameter are reached and before yellowing appears at the blossom end. In general, harvest length is determined by target market. Typical fruit length in English type cucumbers for the fresh whole market is 12 to 14 inches, garden cucumbers destined for the fresh sliced market are harvested at 7.5 to 8.5 inches, and although no USDA standards exist for mini-cucumbers, these fruits are generally harvested when they reach five to eight inches in length.

Frequent harvests are necessary because fruits mature quickly. Continued, timely harvest keeps the plants in a productive mode since cucumber plants have a limit to the number of fruits they can support at any one time. Hochmuth (2009) stated that Cucumbers destined for the fresh sliced market are hand harvested one to three times per week depending on weather and stage of growth. Pickling cucumbers are generally harvested by hand more frequently or they can be mechanically

Print ISSN: ISSN 2059-1187, Online ISSN: ISSN 2059-1195

harvested in larger quantities to free up the land for replanting or rotation to another crop. Hochmuth (2009) also stated that Cucumbers are inspected in the field prior to harvest for mechanical damage, disease, and cosmetic defects. Unmarketable fruit are pulled from the plants and disked into the soil after harvest is completed. Vocational education improves farmers' skills in identifying appropriate means for storage and market survey (Olaintan, 2004).

Role of Vocational Agricultural Education in increasing agricultural productivity

Vocational Agricultural education plays important roles to enhance agricultural productivity and this necessitates its reappraisal towards improving the national economy. The role of vocational agricultural education in development can be summarized in accordance with Ukpongson and Mangiri (2000), as follows:

i. The development of machinery and other equipment like tractor ridger, planter, and combined harvester to replace the old tools like hoe and cutlass.
ii. Vocational education is a motivating force; just as a university bound students are motivated by the fact that the occupation (profession) of their choice requires a university education and universities have certain admission requirements, so employment-bound youth in high schools/ technical colleges can be challenged by the occupation of their choice, the job entry requirements.
iii. Vocational education may help in producing nutritionist who could help in developing different types of foodstuffs for animals and chemical like fertilizers for plants.
iv. Vocational education help to produce building engineers to develop farm buildings like pens for livestock, pens for poultry and pig silos, cribs for storage and even construction of dams to supply water and electricity.
v. Vocational education helps in the development of modern methods of processing plant and animal products like shelling and canning.
vi. To provide technical knowledge and vocational skill for, industrial, commercial and economic development.
vii. To produce people who can apply scientific knowledge to the improvement and solution of environment and such as pest and disease, erosion degradation, pollution etc, for the use and convenience of man.
viii. To enable our young men and women to develop an intellectual understanding of the increasing complexity of problem limiting farm production.
ix. To give training and impart the necessary skills leading to the production of crafts man, technicians and other skilled personnel who will be enterprising and self- reliant.
x. Vocational education is instrumental to a buoyant modern economy as it requires for rapid growth and development, skilled manpower in agriculture and food production, building, business, catering, design/construction, commerce, energy, manufacturing and water supply.

METHODOLOGY

Ikwerre Local Government Area is one of the 23 Local Government Areas in Rivers State Nigeria. The study area shares boundary with Etche, Emohua, Obio/Akpor Local Government Areas and Imo State. It is predominantly rural; with good vegetation and climate that supports all year round agriculture. Hence majority of the inhabitants depend on agriculture for livelihood. The study was a descriptive survey. The target population was 108 registered cucumber farmers. It was a census

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study as the entire population was studied. The instruments for data collection were well validated and structured questionnaire and interview scheduled for those who could not respond properly to the questionnaire items. The instrument was pattern in a 4-point rating scale, showing the degree of need. The reliability coefficient (r) of 0.81 established using test-retest method. The data were analyzed descriptively using Mean and Standard Deviation.

RESULTS AND DISCUSSION

Research Question 1: What are the vocational education needs of cucumber farmers for pre-planting and planting operations for enhancing productivity in Ikwerre Local Government Areas?

Table 1: Respondents Opinion on Vocational Education needs of Cucumber farmers for Pre-Planting and Planting operations (N= 108).

S/N	Areas of Educational needs	$\overline{X}$	SD	Remarks
1	Selection of site with good soil for planting	3.50	0.67	Highly Needed
2	Tilling the soil (ie. ploughing and harrowing)	3.65	0.76	Highly Needed
3	Mulching techniques and materials	3.54	0.76	Highly Needed
4	Determination of spacing distance	3.67	0.74	Highly Needed
5	Identification of good seed variety	3.56	0.79	Highly Needed
6	Chemical treatment of seeds against diseases	3.73	0.85	Highly Needed
7	Determine the need for soil treatment	2.88	0.63	Highly Needed
8	Ability to determine germination time/estimate	3.32	0.71	Highly Needed
9	Ability to determine best planting time and period	3.13	0.81	Highly Needed
10	Site mapping	3.23	0.65	Highly Needed

Research Question 2: What are the vocational education needs of cucumber farmers for post-planting operations for enhancing productivity Key: Highly Needed (HN), Needed (N), slightly Needed (SN) and Not Needed (NN).

The data presented in Table 1 showed that cucumber farmers need vocational education to increase knowledge on selection of site with good soil for planting, mulching techniques, identifying good seed variety and ability to determine best planting time and period. The study also showed that cucumber farmers need vocational education to determine the need for soil treatment and knowledge in tilling the soil. This study is in line with Ogbodo, et al (2010) who opined that farmers need vocational education in agriculture as a way of acquiring knowledge and necessary skills in agricultural production. in Ikwerre Local Government Areas?

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Table 2: Respondents Opinion on Vocational Education needs of Cucumber farmers for post-planting operations (N= 108).

S/N	Areas of Educational needs	$\overline{X}$	SD	Remarks
7	Maintenance of recommended soil moisture level through irrigation or drainage.	3.53	0.62	Highly Needed
8	Removal of old and diseased cucumber plants from the field.	3.64	0.84	Highly Needed
9	Application of pesticides to control disease infections.	3.61	0.75	Highly Needed
10	Spray cucumber plants with insecticide to reduce insect vector during pre-flowering stage.	3.54	0.85	Highly Needed
11	Injection of soluble fertilizers through irrigation systems.	3.59	0.81	Highly Needed
12	Timing and techniques of weed control	3.49	0.84	Highly Needed

Key: Highly Needed (HN), Needed (N), slightly Needed (SN), and Not Needed (NN).

The data presented in Table 2 showed that cucumber farmers needs vocational education for maintenance of recommended soil moisture level through irrigation or drainage, removal of old and diseased cucumber plants, application of pesticides to control disease infections. The study also showed that cucumber farmers need vocational education to inject soluble fertilizers through irrigation systems. These findings are in line with Deekor (2017) who stated that cucumber farmers need vocational education to identify insect, bacterial, fungal, and nematode infections in plants.

Research Question 3: What are the vocational education needs of cucumber farmers for harvesting, packaging and marketing operation for enhancing productivity in Ikwerre Local Government Areas?

Table 3: Respondents Opinion on Vocational Education needs of Cucumber farmers for harvesting, packaging and marketing operation (N= 108).

S/N	Areas of Educational needs	$\overline{X}$	SD	Remarks
13	Accurate timing of harvest.	3.72	0.79	Highly Needed
14	Hold cucumber fruits close to the stem and clip or snap with a slight twist motion.	3.06	1.18	Highly Needed
15	Wash cucumber fruits in the prepared chlorinated water.	3.30	0.79	Highly Needed
16	Different methods of harvesting of cucumber at recommended storage of temperature and humidity	3.70	0.75	Highly Needed
17	Carrying out a feasible market survey to identify competitors, consumers' needs and market windows.	3.63	0.59	Highly Needed
18	Expand market for cucumber produce	3.51	0.65	Highly Needed

Key: Highly Needed (HN), Needed (N), Slightly Needed (SN), Not Needed (NN).

The data presented in Table 3 showed that cucumber farmers needs vocational education for accurate timing of harvest, to hold cucumber fruits close to the stem and clip, application of different methods of harvesting of cucumber at recommended storage of temperature and

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humidity. The study also showed that cucumber farmers need vocational education to carry out a feasible market survey to identify competitors, consumers' needs and market windows and to expand market for cucumber produce. These findings are in line with Olaintan (2004) who posited that vocational education improves farmers' skills in identifying appropriate means for storage and market survey.

CONCLUSION

Based on the findings, it was therefore concluded that cucumber farmers need vocational education to acquire managerial skills in pre-planting, planting, post-planting, harvesting, storage and marketing of cucumber produce. These skills improve farmers' ability to select good soil site, tilling the soil, site mapping, removal of diseased crops, planting and spacing thereby improving quality production of cucumber in the market.

Recommendations

Based on the findings and conclusion, the study therefore recommended that:

1. Rivers State government should direct the vocational education centers to integrate the identified skills in commercial cucumber production enterprises into skill acquisition centers for training youths for employment and retraining farmers for competency on the job.
2. Rivers State government should extend proper vocational education to rural cucumber farmers. This will help to inculcate the required skills and technical-know-how to farmers.
3. Cucumber farmers in Ikwerre Local Government Area of Rivers State should be encouraged and motivated to enroll in Vocational Education centers in the state to learn the skills needed in commercial cucumber production for sustainable living.
4. The curriculum planners should use these findings to advise the schools and colleges or universities of agriculture to adopt the packaged programmes into their training programmes for preparing youths for employment in the field of agriculture.

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Print ISSN: ISSN 2059-1187, Online ISSN: ISSN 2059-1195