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## **Training Needs of Melon (*Citrillus colocynthis (L.) schrad*) Farmers in Okigwe Agricultural Zones of Imo state, Nigeria**

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## **Abstract**

*This study ascertained training needs of melon farmers in Imo State, Nigeria. Multi-stage sampling procedure was used to select 100 melon farmers from 10 town communities in the selected rural households. Data were collected through structured questionnaire and analysed using percentage and mean scores. Results from the study showed that the farmers training need in melon production among others were: sourcing of credit facilities ( $\bar{x}$ =3.65), appropriate market information ( $\bar{x}$ =3.58) and sourcing and training on fertilizer application ( $\bar{x}$ =3.50). The main channel of communication among farmers was sales agents (hawkers) and marketers of melon products ( $\bar{x}$ = 3.06). The major constraints to melon production were inadequate fund ( $\bar{x}$ = 3.24), poor sales/ pricing system ( $\bar{x}$ =3.15), low shelf life of processed melon products ( $\bar{x}$ =3.11). Extension outfits should disseminate information and educate farmers on credit facilities, appropriate market and training on new techniques of how to cultivate melon in and out of season.*

**Keywords:** Households, agricultural extension, melon production.

## **Introduction**

Melon 'egusi' in Igbo language, 'agushi' in Hausa and 'Elegusi' in Yoruba' is a well consumed vegetable crop in Africa and Asia continents (Giwa and Akanbi, 2020). The vegetable crop is an annual, tropical and subtropical creeping herbaceous crop in the *cucurbitaceae* family (El-Keblawy, Shabana, Navarro, and Soliman, 2017).

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The flesh of melon is light yellow and bitter in taste (Olubi, Felix-Minnaar, and Jideani, 2018). The crop is often planted as intercrop (with okro, yam, maize, cassava) and it serves as weed suppressor in the farms (Omovbude, Udensi and Orluchukwu, 2017). Melon grows to maturity within six to eight months and on proper monitored harvest, good quality seed could be produced for next planting season (Iekene, Nsami, Raul, Kouotou, Belibi, Bhangar and Mbadcam, 2018).

In 2017, melon production in Nigeria was 1,002.300 metric tons compare to 248.740 metric tons in 1999 (National Bureau of Statistics [NBS] (2017). There has been insufficient agricultural research carried out on smallholder melon farmers cultivating with outdated undeveloped tools resulting to poor yields (FAO, 2015). There is lack of improved technology available to melon farmers for production (Oyediran, Omoare, and Ajagbe, 2016). Traditional methods of cultivation have affected farmers' income earnings and standard of living with poor contribution to rural development.

Increased awareness of the nutritional benefits of vegetable crops seem to put pressure on farmers for melon production. Melon plays a vital role in the reduction of food insecurity, enhancing of human nutrition and rural development (Chivenge, Mabhaudhi, Modi, and Mafongoya, 2015; Oyediran, Omoare, and Ajagbe, 2016).

Melon seeds have both nutritional and enhancing importance ranging from 50% oil (non-cholesterol), 35% crude protein, Vitamins A, C, B2, alpha-tocopherol (component of Vitamin E) riboflavin, carbohydrates (insignificant amount) and calcium (Olushola-Siedoks, Igbo, Asieba, Ojo, Akinola and Igwe, 2019). In addition, the seed contains Sodium (Na), Iron (Fe), Manganese (Mn), Copper (Cu), Zinc (Zn) (Olubi, Felix-Minnaar, and Jideani, 2018; Sotayo, 2020). The vegetable crop contains an amino acid which is comparable to that in soyabeans and egg white (Olubi, Felix-Minnaar, and Jideani, 2018). Melon seed oil can be used as cooking oil and in manufacturing of margarine, while the cake residue is used as source of protein for livestock feed (Olubi, Felix-Minnaar, and Jideani, 2018). The seed is highly valued in culinary traditional dishes such as melon soups, food thickeners, fried melon balls as snacks. The melon seed when blended with water and honey turns milky, and serves as supplementary baby formula against malnutrition (Omowaye-Taiwo, Fagbemi, Ogunbusola, and Badejo, 2015; Oyediran, Omoare, and Ajagbe, 2016).

Despite its nutritional content and commercial value, its production remains low. Melon though could be cultivated on a wide range of environmental conditions; is still cultivated as a seasonal crop in Imo State. Thus, in the rainy season there is glut, while in the dry season melon becomes scarce with fluctuation in price (Iwuchukwu and Ekeh, 2017). This suggest that farmers lack the knowledge to increase production, which may necessitate training to overcome the challenges. In which specific areas of production do these farmers need to be trained. The study ascertained the training needs of melon farmers in Okigwe Agricultural Zones in Imo State, Nigeria. Specifically, the study:

- identified the training needs of farmers in melon production;
- ascertained the channels of communication on melon production among melon farmers; and
- identified the constraints faced by farmers in melon production.

## Methodology

This study was conducted in Imo State. It is made up of 27 local government areas (LGAs). The State has a projected population of 5,408,756 (National Bureau of Statistics [NBS], 2018). It lies on latitude 4<sup>0</sup>45'N and 7<sup>0</sup>15'N north of the equator and on longitude 6<sup>0</sup>50'E and 7<sup>0</sup>25 East of the Greenwich meridian (Imo State gov.ng, 2010). The state is delineated into three (Owerri, Okigwe and Orlu) Agricultural Zones.

All farm households producing melon constituted the population for the study. Multistage sampling procedure was used in the selection of sample for the study. First, Okigwe Agricultural Zones was selected due to the high concentration in the number of melon farmers in that zone. In the second stage, two LGAs (Ihitte/Uboma and Obowo LGAs) were purposively selected from Okigwe Agricultural Zone based on their involvement in melon production. Thirdly, five town communities each were purposively selected from twenty town communities in Ihitte/Uboma LGA and twenty-two town communities in Obowo LGA, giving a total of ten town communities for the study. Finally, ten farmers who were involved in melon production were selected from each of the town communities through purposive sampling technique. This gave a total of 100 farmers for the study and structured questionnaire was used for data collection. On the whole, 98 respondents that filled and returned their questionnaire copies formed the sample size.

Data collected from the respondents were analysed using percentage and mean. To identify the training needs of farmers, ascertain the channels of communication, and identify the constraints faced by farmers in melon production, a four-point rating scale as strongly agreed (SA)=4, agreed (A)=3, disagree (DA) =2 and strongly disagreed (SD) =1 was used. The cut off- point was 2.50.

## Results and Discussion

### Training Needs of Farmers in Melon Production

Table 1 indicates that the areas of training needs in melon production include: source of credit facilities ( $\bar{x}$ =3.65), appropriate market information ( $\bar{x}$ =3.58), sourcing and training on fertilizer application ( $\bar{x}$ =3.50), record keeping and assessment

( $\bar{x}$ =3.37), pests and disease control management ( $\bar{x}$ =3.37), sourcing of melon seed ( $\bar{x}$ = 3.21), home management practices ( $\bar{x}$ =3.18), information on planting and harvesting methods ( $\bar{x}$ =2.93) and health benefits of melon ( $\bar{x}$ =2.73).

Indicating information on source of credit as a major training need means that the farmers would not make effort to approach any source of credit. The farmers will be constrained to depend on available family credit facilities, which historically, cannot lead to increase or expansion in output. The implication is that processor will find it difficult to break out of their present level of processing output, and by implication not breaking out of the current level of poverty. Convenience in obtaining credit by farmers is key for success of agricultural production (Deresse and Zerih, 2018)

Indicating appropriate market information as a major training need implies that the farmers would not bother to breach any gap in market knowledge. The farmers would depend on existing traditional marketing information. This could invariably lead to the farmers not following new trends in sell of melon produce at current price, thus delaying them from having enough revenue to go into new production. Thus, appropriate market information could result to increase in the farmers' sales, profit and growth in melon business.

Signifying sourcing and training on fertilizer application as major training need would imply that the farmers do not have adequate understanding on skills and procedure for applying fertilizers necessary for successful melon cultivation (Rahman, Khatun, Rahman and Haque, 2018). This implies that the farmers unscientifically apply fertilizer to cultivation of melon. Farmers need adequate amount of fertilizer at the right time and in correct application to attain high yields in melon production. Inadequate supply of fertilizer could be caused by delay in supply due to poor road network and the removal of fertilizer subventions for farmers (Ochola and Fenging, 2015).

Record keeping and assessment as training need suggest that the farmers rely on unwritten, memory record keeping. Relying on memories will easily be forgotten after a short while unlike written records which could be referred when needed. The finding implies that the farmers do not have formal education and are not fully aware of the importance of a detailed farm record as prerequisite for obtaining credits from donor agencies. Farm record keeping could provide valuable information to farmers on proper methods in farm operations. Through farm records, farmers can envisage their strengths and weaknesses and can make better forecast of price fluctuations of melon inputs and sales of produce.

Indicating pests and disease control management as training need would imply that the farmers experience low melon yield due to the attack of pests and disease on their farm produce/product. Unblemished melon seed would attract more earnings for the farmers, thus compelling them to source for pests and disease control. Successful control of pests and disease will be crucial to farmers for lucrative melon

production. Pests and disease incidence varies according to location of farm lands and season. Thus, there is need for information on pest ecology and dynamics to enable farmers take proper action in managing their melon crops efficiently. Inadequate use of agronomic practices, pesticides and fertilizers by farmers results in low yield (Ekunwe and Enato, 2016).

Sourcing of melon seeds as indicated as training need could imply that the farmers rely on traditional recycling, collection and storing of seeds for harvested seeds for next planting season. This could be that the melon farmers are deficient in improved melon seeds supply and are constrained to reserve some of their harvested seeds for the next planting season.

Home management practices training need would be an indication that the farmers lack adequate knowledge on use of human resources in production. This could compel them to operate within their ability resulting in low yield and perpetual unhygienic pattern. Home management practices in extension will be achieved when comprehensive agricultural production and rural development from research stations to the farmers applied. Agricultural extension services are considered as the most essential activities in attaining well-structured transfer of knowledge from research to the farmers (Danso-Abbeam, Ehiakpor, and Aidoo, 2018).

Indicating information on planting and harvesting methods as training need by the farmers suggest that they do not have adequate knowledge about methods in melon production (such as clearing of farm lands, tilling of soil, weeding and harvesting). This could imply that the melon farmers are new in the enterprise, thus having low experience and skill required in melon production.

Indicating health benefits of melon as a major training need would mean that the farmers might not be knowledgeable on health benefits of melon. Attained knowledge on melon benefits would help the farmers advertise their produce and increase their interest in melon production. Health benefits of melon will expose the farmers to more value addition in melon instead of relying on the convectional utilization methods (as soup thickener).

**Table 1: Farmers training needs in melon production**

Training Needs	Mean ( $\bar{x}$ )	Std. Deviation (SD)
Home management practices	3.18	.854
Sourcing of melon seed	3.21	.750
Record keeping and assessment	3.37	.694
Sourcing of credit facilities	3.65	.644
Information on planting and harvesting methods	2.93	.977
Appropriate market information	3.58	.516
Pests and disease control management	3.37	.817
Health benefits of melon	2.73	1.031
Sourcing and training on fertilizer application	3.50	.596

**Source:** Field Survey, 2019

## Channels of Communication in Melon Production

Table 2 shows the channels of communication in melon production as include: sales agents (hawkers) and marketers of melon products ( $\bar{x}=3.06$ ), local government agencies programmes ( $\bar{x}=2.87$ ), radio programme giggle ( $\bar{x}=2.85$ ), health workers in the hospitals, clinics, health centres and maternity homes ( $\bar{x}=2.81$ ), friends and relatives ( $\bar{x}=2.80$ ), restaurants, hotels, eating centres ( $\bar{x}=2.56$ ), extension home visits ( $\bar{x}=2.52$ ). The least identified by farmers as channel of communication in melon production was television/print media ( $\bar{x}=2.00$ ).

The results reveal that farmers identified sales agents (hawkers) and marketers of melon products as the most effective channel of communication. Most agricultural produce are sold in the markets; it is not surprising for farmers to exchange information on melon production among themselves in the market. Effective channel of communication of agricultural information to farmers is very important. Effective communication is crucial in getting feedback from the farmers to researchers for agricultural development (Okeke., Nwalieji and Uzuegbunam, 2015).

**Table 2: Channels of communication in melon production among the farmers**

Items	Mean ( $\bar{x}$ )	Std. Deviation (SD)
Sales agents (hawkers) and marketers of melon products.	3.06	.906
Local government agencies programmes	2.87	.991
Radio programme giggle	2.85	1.009
Health workers in the hospitals, clinics, health centers and maternity homes.	2.81	.927
Friends and relatives/family members	2.80	.837
Restaurants, hotels, eating centers	2.56	1.016
Extension home visits	2.52	1.151
Television/Print media	2.00	.799

**Source:** Field Survey, 2019

## Constraints to Melon Production

Data in Table 3 show the major constraints to melon production as: inadequate fund ( $\bar{x}= 3.24$ ), poor pricing system ( $\bar{x}=3.15$ ), low shelf life of processed melon products ( $\bar{x}=3.11$ ), lack of access to improved melon varieties ( $\bar{x}=2.95$ ), pests and disease management problem ( $\bar{x}=2.90$ ) and high cost of labour ( $\bar{x}=2.54$ ).

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Inadequate fund as a major constraint means that the farmers are smallholders who are in need of empowerment/funds in other to expand to large scale melon farming. Poor funding could be a serious threat to melon cultivation and lifting the farmers out of poverty. Thus, extension agents linking the farmers with the appropriate fund-raising bodies will empower the farmers in melon production.

Indicating poor pricing system as serious constraint would mean that the farmers do not get good price for their produce at the time of sale. Consequently, their return on investment is very low to encourage increased production. This is an indication that the farmers do not have access to the appropriate market for sell of melon seeds. Melon farmers require training on access to the right market for proper pricing system and sale of produce.

Low shelf life of processed melon products as a constraint is an indication that the farmers could be unskilled in post-harvest processing and preservation of melon. This implies that melon produce mostly spoil within a short period of storage. Training farmers by extension on improved storage methods would increase the shelf life of melon making it possible for melon to be in abundance in and out of season. Decline in melon production could be associated to processing and value addition problems (Giwa and Akanbi, 2020).

Indicating lack of access to improved melon varieties as serious constraint could suggest that the farmers still cultivate traditional melon seeds and they lack access to improved seeds. Invariably they do not cultivate seeds that are resistant to pests and disease and environmental hazards (such as climate change). Hence, the need for extension to identify these farmers and provide them with improved seeds. Adequate information should be made available to smallholder farmers to reduce poverty, abate food insecurity (Apantaku, Aromolaran, shobowale and Sijuwola, 2016).

Indicating pests and disease management problem as a serious constraint by farmers suggest that melon production is attacked by infections. This could be an indication that the farmers are experiencing low yield due to harm and destructions caused by pests and disease their produce. Training farmers on pests and disease management will increase melon yield.

The farmers indicating high cost of labour as serious constraint would mean that they have small household size that might not supply enough labour in melon production. This implies that the farmers would hire paid labour for farm activities. High cost of labour would affect the farmers earning and impoverish their melon production. There is need for extension agents to acquaint melon farmers on right places and proper time to source for farm labour at minimal cost. This would imply that extension agents might train farmers on use of simple farm machineries to limit high cost in hiring farm labour.

**Table 3: Constraints to melon production**

Items	Mean ( $\bar{x}$ )	Std. Deviation (SD)
Inadequate fund	3.24	.787
Poor pricing system	3.15	.817
Low shelf life of processed melon products	3.11	.758
Lack of access to improved melon varieties	2.95	.889
Pests and disease management problem	2.90	.753
High cost of labour	2.54	1.007
High cost of farm inputs (fertilizer, agro chemicals)	2.44	.909
Inadequate farmers' knowledge of improved production and processing methods	2.23	.982

**Source:** Field Survey, 2019

### Conclusion and Recommendations

The major areas where melon farmers need training include source of credit facilities, appropriate market information and fertilizer application. Melon farmers most effective channel of communication was from sales agents (hawkers) and marketers. Nevertheless, constraints such as inadequate fund, poor pricing system, low shelf life of processed melon, lack of access to improved melon varieties, problem of pests and disease management, high cost of labour and farm inputs, and inadequate farmers' knowledge of improved production and processing methods limit farmers' melon production. Government and private initiatives should through extension agents train and educate farmers on sources of funding, how to improve the pricing system, improve shelf live, pest and disease management. Attention of research should be drawn on the need to develop improve varieties of melon to increase yield and shelf live. Research should also work on developing a mechanised method of land preparation and processing suitable for small scale melon farmer.

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