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PERCEIVED BENEFITS OF IMPROVED PRACTICES IN PRE HARVEST TOMATO PRODUCTION AMONG FARMERS IN AFIJIO LOCAL GOVERNMENT AREA, OYO STATE

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Abstract
This study was designed to investigate the perceived benefits of improved practices in pre-harvest tomato production among farmers in Afijio Local Government Area of Oyo State. Multistage sampling techniques were used to select respondents in the study area, with the aid of structured questionnaire. Descriptive and inferential (PPMC) statistics were used to analyze the data. Majority of the respondents (88.5%) perceived that it has lots of benefits. Also, 82.7% perceived that improved practices minimize post-harvest losses on a medium scale. Furthermore, 85.6% perceived that improved practices minimize disease infestation on a medium scale, while 84.6% perceive it protects tomato from decaying. Also, 76.9% of the respondents perceive that improve practices helps to retain nutritional content of tomato on a medium scale. Also, the category of the respondents that had high awareness considered the improved practices to be highly beneficial to them. The study further concluded that the benefits derived by minority of the respondents influenced most of the respondents to have favorable perception to derivable benefits embedded in improved practices of tomato in the study area. In addition, the result also revealed significant relationship between awareness and perceived benefits of improved practices in pre-harvest tomato production (r=0.280, p=0.004). The study therefore recommended that the extension agents should properly train the farmers on the benefits and use of these improved practices. Adequate information should be made available to the tomato farmers on the most recent developments in tomato farming and production (pre harvest and post-harvest). The government should be able to provide adequate and glitch free loan to the farmers to enable them utilize the information and training.

Keywords: Coco Peat, Green House, Drip Irrigation, Grow Bags, Fertilizer

Introduction

Tomato (*Lycopersicon esculentum* Mill.) is one of the vegetables with the highest production in the world and its production is increasing. Tomato probably originated in Peru, although introduced in Italy at the beginning of the sixteenth century as an ornamental plant, it was not being grown for food until the middle of that century. Its cultivation has become widespread over the subsequent centuries and is now one of the world's major food crops (Frusciante *et al*., 2000.) It is currently considered as one of the main vegetable crops in the world and constitutes an economic force that influences the income of many growers in the world (Omar, 2005). Furthermore, it is used as a condiment in stews and soup or eaten raw in salads (Balarabe, 2012). Industrially, the crop is made into puree, sauce, paste and powder. In the recent decades, the consumption of tomatoes has been associated with prevention of several diseases (Sharoni and Levi,
2006) mainly due to the content of antioxidants including carotenes, (Lycopene and -carotene),ascorbic acid, and phenolic compounds (Periago *et al*., 2009). Nutrients, when in adequate quantity, increases fruit quality, fruit size, color, and fruit taste of tomato. Tomato production cuts across Nigeria's geo-political zones and generates income to the farmers, but the production system is on a low scale in southern guinea savannah, due to improper fertilizer use, which leads to increases in soil acidity (Olatunji *et al*., 2012). Improved practices such as the use of fertilizer, coco peat, green house, plastic mulching, drip irrigation, planting bag and micro nutrients should be adopted by farmers, in order to produce healthy fruits. The benefits attached to the use of these improved practices are enormous, hence the need for this study.

Applying fertilizers to the land has so many advantages which include; increase in crop yield, improves poor quality land, manure improves soil texture, recycles nitrogen and introduces essential bacteria, pasture is improved so animals fatten up quicker; once marshland is drained, fertilizers can help reclaim that land for

pasture and crops grow faster – particularly when hybrid seeds are used. An adequate supply of potassium fertilizer in tomato production improves fruit colour and reduce the incidence of yellow shoulder (Hartz *et al*., 2005), whilst enhancing the titratable acidity of the fruit (Passam *et al*., 2007). However, plastic mulch also has quite a number of advantages and this is very important for farmers to know how beneficial plastic mulch is; plastic mulch helps with weed and pest management. Notably, vegetable quality is often improved, primarily due to the plastic being a barrier between the soil and fruit (Tiffany and Dan, 2016). Protected cultivation is one of the revolutionary ways for realizing optimum yields over a decade amid the challenges like globalization of markets, shrinking cultivable lands and climate change. This is the technique wherein the microclimate around the Plant is controlled fully or partially to protect the crop from adverse conditions and cultivation (Maitra *et al*., 2020). Mulching is one of the potential protected cultivation approaches to serve this purpose. It is a protective ground cover that can include manure, saw dust, seaweed, litter, stubbles, sands, pebbles, plastics, and other natural products (Maitra *et al*., *ibid*).

Drip irrigation also has numerous advantages that can be really helpful to farmers. With drip irrigation, Water is used at maximum optimum level. Again, weeds cannot absorb water as no water is available for them and thus grow in less number. Furthermore, Crop yield is at optimum and fertilizers can be used with high efficiency. In addition, drip irrigation helps to minimize operating cost and no soil erosion. Also, soil infiltration capacity is increased and seed germination improved and can use recycled water safely. Furthermore, with drip irrigation, it is not necessary to level the fields and irrigate water in irregular shaped lands (Riyo, 2018). Furthermore, grow bags are so advantageous and they help with a healthier root system that encourages root pruning rather than root circling. Also, grow bags prevents over-watering since excess water percolates out through the fabric material (Carole, 2018). Furthermore, it can be folded flat and stored in a small space and can be easily moved and even planted directly into the ground. In the field of new technologies, preliminary studies have shown that the use of biodegradable plastics growers can reduce the amount and cost of disposal. Photodegradable plastics, mulch film and biodegradable plastics have been considered by researchers to replace petroleum based plastics (Halley *et al*., 2021). In addition, Coco Peat which is one of the improved Farming practice is useful to make mixtures of Potting; it is the best support in nursery seedling (Kane: 2019).

Pre harvest Tomato production is a very vital aspect of farm process and this can either destroy or help the farmers with an impressive output. It is very important for farmers to know the improved practices and to utilize the information gotten about these practices for enhanced yield.

Methodology

This study was carried out in Afijio Local Government Area (LGA) of Oyo State. It is located at Jobele which occupies a land area of 685.0852km with estimated population size of 152,193 using a growth rate of 3.2% from 2006 census. The population density of the area is 222 persons per square kilometer. It is bounded in the North by Oyo East LGA, Akinyele LGA in the South and Iseyin LGA in the West. The Yoruba mainly dominate Afijio LGA. The inhabitants are mostly farmers who had taken the advantage of vast agricultural land that favours the cultivation of food crops such as tomatoes, maize, guinea corn, yam, cassava, cowpea, soya beans, fruits and cash crop such as groundnuts, cocoa, oil-palm, kolanuts, coffee, orange and citrus. Oyo State is an inland state in South-western, and lies in the South/Western zone of the State which is roughly enclosed by Latitude 7.8° and 4.4° North of the equator. The postal code of the area is 211. The data was collected with the aid of a structured questionnaire using likert items and scales to elicit information from the respondents. The data was analyzed using descriptive analysis such as frequency counts and percentage. Pearson product moment correlation (PPMC) was used to test the relationship between awareness on improved practices and perceived benefit derived from using improved practices in pre-harvest tomato production. Data for this study were collected using a well-structured questionnaire, informal oral interview and visual observation. Afijio LGA was purposively chosen because there are so many tomato farmers in that area. Therefore, 105 Tomato farmers were randomly selected from the study area.

Measurement of Variables

The demographic characteristics of respondent's variables included in the study are; Gender, age, marital status and farming experience. Gender was measured as male and female. Age was measured in years and categorized into four categories. Marital status was measured as single and married. The farming experience of farmers was categorized into four. Awareness on the type of improved practices in pre-harvest tomato production was measured on a 2-point scale of (No and Yes). With assigned values of 1 and 2 respectively (1 is the minimum and 2 is the maximum) and this objective was addressed using 8 items. Perceived benefit of improved practices in pre-harvest tomato production was measured on a 4-point scale of (no benefit, low, medium and high). With assigned values of 1,2,3 and 4 respectively (1 is the minimum and 4 is the maximum) and this objective was addressed using six (6) items.

Sampling Procedure and Techniques

The target population of study is tomato farmers in Afijio LGA. Multi stage sampling method was used to carry out this research. Stage l: Afijio local government was purposively chosen because it has the highest number of tomato farmers in Oyo State. The local government has 10 wards namely; Ilora l, Ilora ll, Ilora lll, Fiditi l, Fiditi ll, Awe l, Awe ll, Akinmorin/Jobele, Iware, Imini. Stage ll: Iware was

purposively selected because they have the highest number of farmers that produce tomatoes as their main crop for commercial purpose. Stage III: There are forty-nine villages in Iware, (Four villages were randomly selected which are Ajingodo, Orilangbogbo, Adebimpe, Agoowu. Stage lV: The study took place in the randomly selected villages and 105 questionnaires were distributed. More farmers were seen in Ajingodo next to Adebimpe, and then the least number of farmers were seen in Agoowu and Oriiangbogbo. Furthermore, 34 questionnaires were distributed to the respondents at Ajingodo, 20 questionnaires at Orilangbogbo, 30 at Adebimpe, and 21 Agoowu. Therefore, 104 questionnaires were retrieved. Also, some of the questions were read to the respondents due to high level of illiteracy and busy schedule of the respondents.

Analytical procedure

The correlation coefficient is given as:

$$r_{xy} = \frac{n\sum XY - \sum X \sum Y -}{\sqrt{[n\sum X^2 - (\sum X)^2][n\sum X^2 - (\sum X)^2]}} \quad \ldots\ldots (1)$$

Where in equation (1): r_{xy} = correlation coefficient ($-1 \leq r_{xy} \leq 1$), n = sample size, and X and Y are the variables under consideration (awareness on pre-harvest improved practices and perceived benefit derived from using improve practices in tomato production).

Results and Discussion

Socio-Economic Characteristics of the Respondents

Table 1 shows that majority of the respondents (58.7%) were male, while 41.3% were female in the study area. This indicates that more males are engaged in tomato production than female probably because farming demand physical energy application. This result follows the work of Birner (2006) that more men are engaged in planting than women. Also, the table shows that 39.4% of the respondents are within the range of 20-30 years, 49.0% 31-40 years, 9.6% 41-50 years and 1.9% within the range of 51-60 years. This result indicates that more youths are involved in farming than adults. This shows that the respondents are in their active age in which they have the strength and energy to carry out farming activities which is in line with the research of Gingras *et al*. (2008) who stated that the younger the farmers, the more productive they are. Furthermore, the table also indicates that 66.3% of the respondents are married, while 33.7% are single. This is supported with the findings of Adelore *et al*. (2006) that most of the farmers are married in their study. About 18.3% of the respondents have 5years of farming experience, 78.8% have 6-10years, 1.9% ll-15years and 1.0% 16-20years of farming experience. This implies that the respondents in the study area started farming at the early stage of their life because it is their major source of livelihood. This is in line with the study of Adelore *et al*., (2006) who stated that farmers who started farming at their early age have more experience to perform better in farming activities.

Table 1: Socioeconomic characteristics of the respondents

Variable	Frequency (N =104)	Percentage
Gender		
Male	61	58.7
Female	43	41.3
Age		
20-30	41	39.4
31-40	51	49.0
41-50	10	9.6
51-60	2	1.9
Marital status		
Married	69	66.3
Single	35	33.7
Farming experience		
Less than 5 years	19	18.3
6-10 years	82	78.8
11-15 years	2	1.9
16-20 years	1	1.0

Source: Field Survey, 2019

Awareness on the type of improved practices in pre-harvest activities of tomato production

The result shows that majority of the respondents (87.5%) make use of fertilizer as a type of improved practice in pre-harvest tomato production (Table 2). This implies that the farmers are well aware and adequately make use of fertilizer for proper growth and development of tomato at pre-harvest stage. This is in line with Smaling (2006) who noted that one of the ways to address the problem of low productivity in agriculture is the use of fertilizer; both organic and inorganic, especially in low income countries where fertilizer use is lowest. Saha *et al*. (2008) also stated that the use of organic manures alongside inorganic fertilizers often leads to increased soil organic matter (SOM), soil structure, water holding capacity and improved nutrient cycling and helps to maintain soil nutrient status, cation exchange capacity (CEC) and soil biological activity. The result also revealed that 53.8% of the respondents have heard of drip irrigation. This implies that a sizeable number of the respondent are aware of the effective use of drip irrigation system to adequately supply water to

the root of tomato and ensure adequate growth of the crop. More so, the result further shows that 86.5% of the respondents have heard of micro nutrients. This implies that larger percentage of the respondents are aware of the use of micro nutrients as one of the types of improved practices in tomato production. Approximately 2–3 billion people worldwide are suffering from micronutrient deficiencies, especially in developing countries where these affect at least half of the population (Goudia and Hash, -2015). Majority of the respondents in the study area had less awareness on green house, coco peat, plastic mulching and planting bag. This implies that the respondents in the study area are yet to be informed on the other improved practices. It also indicates that despite the increasing advantages of improved practices in tomato production, adequate information has not been appropriately discharged to the tomato farmers.

Table 2: Awareness on the Type of Improved Practices in Pre-Harvest activities of tomato production

Types of pre-harvest improve practices heard of	Yes	No
Improved fertilizer	91(87.5)	13(12.5)
Green house	12(11.5)	92(88.5)
Coco peat	11(10.6)	93(89.4)
Plastic mulching	16(15.4)	88(84.6)
Drip irrigation	56(53.8)	48(14.4)
Biodegradable bags or grow bags	15(14.4)	89(85.6)
Micro nutrient	90(86.5)	14(13.5)

Source: Field Survey, 2019

Categorization of Respondents Based on their Level of Awareness on Improved Practices

Table 3 shows the level of awareness of farmers on improved practices in pre-harvest tomato production. Majority (84.6%) of the respondents had low level of awareness on improved practices, while 15.4% of the respondents had high level of awareness.

Table 3: Categorization of respondents based on their level of awareness on improved practices

Categorization	Frequency	Percentage	Mean =3.12
High (> mean)	16	15.4	
Low (< mean)	88	84.6	
Total	104	100	

Source: Field Survey, 2019, Own calculations

Perceived Benefit of Improved Practices in Pre-Harvest Tomato Production

Results in Table 4 show the respondent's perceived benefit of pre-harvest improved practices in tomato production. Majority of the respondents (88.5%) perceived that it has lots of benefits, while only 1.9% perceived that it has no benefit. Also, 82.7% of the respondents perceived that improved practices minimize post-harvest loss on a medium scale. Furthermore, 85.6% perceived that improved practices minimize disease infestation on a medium scale, while 84.6% perceived that it protects tomato from decaying. Also, 76.9% of the respondents perceived that improve practices helps to retain nutritional content of tomato on a medium scale. The nutritional quality of crop produce influences human nutrition either directly or indirectly (Dimkpa and Bindraban, 2016). Consumption of food crops deficient in micronutrients (due partly to lack of adequate micronutrients in the soil) (Manzeke *et al*., 2012), could occasion deficiency of such micronutrients in humans, often referred to as "hidden hunger" (Joy *et al*., 2015). Most (92.5%) of the respondents perceived that improved practices will enhance high income. It was deduced from the study that a relatively high percentage of the respondents do not perceive that improved practices are beneficial. This could be as a result of their not been aware of the other improved practices. In addition to the personal benefits, the drip irrigation generates substantial social impacts in the form of enhanced food security, women participation in agriculture and social status (Shah *et al*., 2014).

Table 4: Perceived benefit of improved practices in pre-harvest tomato production

Perceived Benefit	High	Medium	Low	No benefit
Improve tomato production	92(88.5)	8(7.7)	2(1.9)	2(1.9)
Minimize post harvest losses	11(10.6)	86(82.7)	7(6.9)	0(0.0)
Minimize diseases	12(11.5)	89(85.6)	3(2.9)	0(0.0)
Protects tomato from decaying	88(84.6)	11(10.6)	5(4.8)	0(0.0)
Retains nutritional content	17(16.3)	80(76.9)	2(1.9)	5(4.8)
Enhance high income	12(92.5)	73(70.2)	11(10.6)	8(7.7)

Source: Field Survey, 2019

Relationship between awareness on pre-harvest improved practices and perceived benefit derived from using improve practices in tomato production

Results in Table 5 shows evidence of significant relationship between awareness and perceived benefits of improved practices in pre-harvest tomato production (r=0.280, p=0.004). This implies that the more the farmers level of awareness on improved practices the more the perceived benefits.

Table 5: Relationship between awareness on pre-harvest improved practices and perceived benefit derived from using improve practices in tomato production

Variable	r-value	P-Value	Decision
Awareness and perceived benefits of improved practices in pre-harvest tomato Production	0.280	0.004	Sig.

Conclusion

Based on the findings of the study, the following conclusions were drawn: majority of the respondents (88.5%) perceived that it has lots of benefits. Also, 82.7% of the respondents perceived that improved practices minimize post-harvest losses on a medium scale. Furthermore, 85.6 %perceived that improved practices minimize disease infestation on a medium scale, while 84.6% perceived that it protects tomato from decaying. Also, 76.9% of the respondents perceived that improve practices helps to retain the nutritional content of tomato on a medium scale. Most of the respondents had low awareness, while minority had high awareness. The category of the respondents that had high awareness considered the improved practices to be highly beneficial them. The study further concluded that the benefits derived by minority of the respondents influenced most of the respondents to have favourable perception to derivable benefits embedded in improved practices of Tomato in the study area. The study therefore recommended that the extension agents should properly train the farmers on the benefits and use of these improved practices. Adequate information should be made available to the tomato farmers on the most recent developments in tomato farming and production (pre harvest and post-harvest). The government should be able to provide adequate and glitch free loan to the farmers to enable them utilize the information and training.

References

Adelore, O.O., Olujide, M.G. and Popoola, R.A. (2006). Impact of HIV/AIDS Prevention promotion programmes behavioural patterns among rural dwellers in south western Nigeria. *Kamla-Raj Journal of Human Ecology*, 20(1): 53-58.

Balarabe, S. (2012). Tomato production in Nigeria: Issues and prospects. Ministry of Agriculture and Rural Development Kano, Kano State.

Birner, R., Davis, K. E., Pender, J. L., Nkonya, E. M., Anandajayasekeram, P., Ekboir, J., Mbabu, M. A., Spielman, A. N., Horna,D.J. and Benin, S. (2006). From "best practice" to "best fit" a framework for designing and analyzing pluralistic agricultural advisory services worldwide.

Carole, M. (2018) Grow BagsBottom of Form. Available at https://davesgarden.com/guides/articles/what-are-grow-bags.

Dimkpa, C. O. and Bindraban, P. S. (2016). Fortification of micronutrients for efficient agronomic production: a review. *Agronomy for Sustainable Development*, 36(1): 7.

Food and Agriculture Organization of the United Nations (2004). Institute building to strengthen agricultural extension. 27th FAO regional conference for Asia and the Pacific, Beijing, China, May, 17th – 21st.

Frusciante, L., Barone, A., Carputo, D., Ercolano, M.R., Rocca, F., and Esposito, S., 2000. Evaluation and use of plant biodiversity for food and pharmaceuticals. Fitoterapia, 71: S66–S72.

Goudia, B. D. and Hash, C. T. (2015). Breeding for high grain Fe and Zn levels in cereals. *International Journal of Innovation and Applied Studies*, 12(2), 342–354.

Gingras, Y., Larivière, V., Macaluso, B. and Robitaille, J.-P. (2008). Effects of aging on researchers' publication and citation patterns. *PLoS One*, 3(12), e4048. doi: 10.1371/journal.pone.0004048

Halley, P., Rutgers, R., Coombs, S., Kettels, J., Gralton, J., Christie, G., Jenkins, M., Beh, H., Griffin, K., Jayasekara, R. and Lonergan, G. (2001). Developing biodegradable mulch films from starch-based polymers. *Starch*, 53:362-367.

Hartz, T. K., Johnson, P. R., Francis, D. M. and Miyao, E. M. (2005). Processing tomato yield and fruit quality improved with potassium fertigation. *Horticultural Science*, 40(1): 1862–1867.

Joy, E. J., Stein, A. J., Young, S. D., Ander, E. L., Watts, M. J. and Broadley, M. R. (2015). Zinc-enriched fertilizers as a potential public health intervention in Africa. *Plant and Soil*, 389(1–2): 1–24.

Kane, D. (2019) Advantages and Disadvantages of Coco peat for Farming. Available at https://agriculturegoods.com/disadvantages-coco-peat-advantages/.

Maitra, S., Shankar, T., Sairam, M. and Pine, S. (2020). Evaluation of Gerbera (Gerbera jamesonii L.) Cultivars for growth, yield and flower quality under protected cultivation. *Indian Journal of Natural Sciences*, 10(60): 20271-20276.

Manzeke, G. M., Mapfumo, P., Mtambanengwe, F., Chikowo, R., Tendayi, T. and Cakmak, I. (2012). Soil fertility management effects on maize productivity and grain zinc content in smallholder farming systems of Zimbabwe. *Plant and Soil*, 361(1–2): 57–69.

Olatunji, S.O., Ayuba, S.A., Anjembe, B.C. and Ojeniyi, S.O. (2012). Effect of NPK and Poultry manure on Cowpea and Soil nutrient composition. *Nigerian Journal of Science*, 22 (1): 108-113.

Omar, Z. (2005). Tomato production under protected conditions. Published by Mashav, Cinad co and the peers centre for peace project coordinator. Pp. 71-112

Passam, H. C., Karapanos, I. C., Bebeli, P. J. and. Savvas, D. (2007). A review of recent research on tomato nutrition, breeding and post-harvest technology with reference to fruit quality. *European Journal of Plant Science and Biotechnology*, 1:1–21.

Pedda Ghouse Peera S.K., Subhankar D., and Sagar, M. (2020) Mulching: Materials, Advantages and Crop Production. In: Protected Cultivation and Smart Agriculture edited by Sagar Maitra, Dinkar J Gaikwad and Tanmoy Shankar © New Delhi Publishers, New Delhi: 2020, (pp. 55-66). ISBN: 978-81-948993-2-7, DOI: 10.30954/NDP-PCSA.2020.6.

Periago, M. J., Garc´ıa-Alonso, J. and Jacob, K. (2009). Bioactive compounds, folates and antioxidant properties of tomatoes (*Lycopersicum esculentum*) during vine ripening. *International Journal of Food Sciences and Nutrition*, 60(8):694–708.

Riyo (2018). 20 Advantages and Disadvantages of Drip Irrigation System. Available at https://www.1001artificialplants.com/2018/10/17/20-advantages-and-disadvantages-of-drip-irrigation-system/

Saha, S., Mina, B.L., Gopinath, K.A., Kundu, S. and Gupta, H.S. (2008). Organic amendments affect biochemical properties of a subtemperate soil of the Indian Himalayas. *Nutr. Cycl. Agroecosys*. 80: 233-242.

Shah, T., Shilp, V., Bhamoria, V., Ghosh, S. and Sakthivadivel, R. (2014). Social Impact of Technical Innovations: Study of Organic Cotton and Low Cost Drip Irrigation in the Agrarian Economy of West Nimar Region.

Sharoni, Y. and Levi, Y. (2006). Cancer prevention by dietary tomato lycopene and its molecular mechanisms. in Tomatoes, Lycopene & Human Health, A. V. Rao, Ed., Pp. 111–125, Caledonian Science Press Ltd, Barcelona, Spain.

Smaling, E.M.A. (2006). Fertilizer use and the environment in Africa: friends or foes? Background paper: African Fertilizer Summit: Nourish the Soil, Feed the Content, 9–13 June 2006, Abuja, Nigeria, Pp. 25.

Tiffany. M and Dan. D, (2016) Fruit and Vegetable Organic Certification Basics. Available at Horticulture/Vegetables/2016-02 Extension.usu.edu

Will, M. (2017). 13 Advantages of growing plants within a green house. Available at https://greenerideal.com/guides/13-advantages-of-growing-plants-within-a-greenhouse/