



## STRATEGIES FOR REDUCING THE CHALLENGES OF PATHOGENIC ORGANISM ON THE YAM TUBER IN STORAGE

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### ABSTRACT

The study was designed to identify the ways of reducing the challenges of pathogenic organism on the yam-tubers in storage. Three research questions guided the study. The design of the study was survey research design. The population of the study was ten thousand, nine hundred and six farmers in Ebonyi State. The sample for the study was one hindered and fifty six (156) farmers that produce yam-tubers and store them. Stratified random sampling technique was used in selecting them. Instrument for data collection was structured questionnaire developed by the researcher. The instrument was face validated by three experts, one in the department of science and computer education. Two in Agricultural Education option in the department of technology and vocational education. The crown back Alpha reliability coefficient was used to determine the internal consistency of the instrument. The instrument yielded a reliability coefficient of 0.78, which was good enough for the study. The instrument was administered on the respondents with the help of two researches assistant, mean and standard deviation were used to answer the research questions. The study identified that preventive measures against pathogenic organism reduces its challenges on yam-tubers decay during storage. It identified that control measures, and good management practices, as viable measures, against pathogenic organism that decay yam-tuber. It recommends among others that farmers should utilize the three measures, as routine services in their farm and storage places. Conclusion was made based on the findings of the study.

**KEY WORD:** Strategies, Reducing, *Pathogenic*, Yam, Storage

### INTRODUCTION

Smith (2000) view challenge as to have fight, over an issue, to see, who is better, stronger. In furtherance, Yam-tubers are being fought against by some organism, showing yam-tubers upper hands and decay them. The fight, which the pathogenic organism imposes on yam-tubers, may be spoilage, decay, and Nutritive to them. In the same vein, Ogba (2005) view challenge as the things that pose problem, disturbances, and hindrances to others in certain situation of their relationship. Therefore, challenge in this study implies the problem which the pathogenic organism imposes on yam-tubers in storage, spoil them, decay and reduce its economic value. The organism make yam-tubers, decay, unfit for human consumption. In the view of Nweke, (2008) pathogen is the disease causing agent, while the organisms are responsible for inducing the disease condition to the yam tubers. Eze, (2009) maintain that decay process may be nutritive, fight, upper hand, in their relationship in the ban, underground pit, in shade, during storage, among others. Ukwa (2008) stress that, to store is to keep safe, from destruction, damage, that yam-tubers are kept in safe facilities like ban, underground pit, in shade, tree branches, as ways of safeguarding them from destruction. Okonkwo (2010) is of the view, that pathogenic organism attack the yam-tuber kept in such facilities and destroy them without delay and make such facilities un protective to the yam-tubers. In the same vein, Odo (2008) outlined, the varieties of yam-tubers cultivated and utilized, in

Ebonyi State as *Discorea rotundata*, (white yam), *Discorea calyenesis* (Yellow yam), *Discorea alata* (water yam), *Discorea dumetorum* (three Leaf yam), *Discorea bulbiferia* (Aeria Yam), *Discorea esculentum* (Chinese Yam) These yam-tuber are popular in Ebonyi State and Nigeria in general. These yam-tubers are the chief sources of staple food in the State. Which are prepared in many ways for human consumption? Yam-tubers have high cultural and social values in the society. Akubuilu (2009) maintain that yam-tubers have ceremonial and economic values that its cost implication on production input-output ratio is very high, which demand reasonable financial involvement and appropriate management practices. In support of the above, Anochili (2008), stress that for yam-tuber to be produced a farmer will spend a lot in good tuber sources, or cultivar for procurement, material inputs, management practices, and direct financial involvement. However, it is yam-tubers that farmers sale to get their own sources of income, prepare it as food for consumption, plant it in the farm as input for next year production. It is used for ceremonial, cultural, social and economic value and should not be allowed to be wasted, destroyed, spoil beyond human and animal consumption. However, this can increase poverty level to individuals, hunger, and disease; reduce self-sustenance, on individual bases, harsher economic problem to the society. Therefore, it calls for research investigation to proper solution to the challenges of pathogenic organisms to yam-tubers, in

order to avoid the above mentioned problems associated with yam-tuber in Ebonyi State.

**Statement of the Problem**

The vital role of yam-tuber in the society cannot be over-emphasized, since its production inputs such as labour, capital, management, and other material inputs requires a lot from farmers. Many Ebonyian depend on yam-tuber as their sources of income, sources of food, the only path ways for Ebonyi State ceremonial, cultural, social and economic values to the society. However, yam-tuber is the best sources of food among other source of food, (Eze, (2005). Domestic industries use them as sources of raw material; it increases economic wellbeing of many Ebonyians. Therefore, the worries of the researcher are that since, yam-tubers have these utilitarian functions to humanity. The challenges of pathogenic organism on yam-tuber need to be investigated to determine, its preventive measure, control measure, management method, among others to ensure the maximum use of yam-tubers in Ebonyi State and Nigeria in general

**Purpose of the Study**

The purpose of the study is to determine the challenges of pathogenic organism on yam-tuber in the storage, specifically, the study tend to:

1. Determine the preventive method available for pathogenic organism that decay yam tubers.
2. Determine the control method available for pathogenic organism that deteriorates yam tubers.
3. Determine the best management measure available for pathogenic organisms that decay yam-tubers in storage.

**Research Questions**

1. What are the preventive measures available for pathogenic organism on yam-tubers in storage? (ban, Pit, leaves, shade)
2. What are the control measures available for pathogenic organism on yam-tubers in storage?

3. What are the management measures available for pathogenic organism on yam tubers in storage?

**METHODOLOGY**

The area of the study is Ebonyi State of Nigeria. It is one of the states in the South East geopolitical zone of Nigeria. The design of the study was survey research design. The population for the study comprises, of the entire rural farmers that participate in yam-tuber production and storage in Ebonyi State. Which is ten thousand nine hundred and six (10,906)? Statistical digest 2012. The sample for the study was one hundred and fifty six (156) farmers in Ebonyi State. Stratified random sampling technique was used in selecting the sample for the study. The researcher developed structured questionnaire for collection of data with four point rating scale of strongly agree, agree, disagree, and strongly disagree. (SAADSD). The instrument were validated by three experts, one in measurement and evaluation in science education department, and two in agricultural education unit in the department of technology and vocational Education in the same faculty and university. The instrument was tested using crown back alpha. The reliability coefficient was 0.78, which was good enough to be used in the study. The instrument was administered on the respondent with the help of two research assistant, one in each education zone. While the researcher covered one education zone during Ebonyi, farmers show day. One hundred and fifty six (156) questionnaires were completed and returned. The data collected was analyzed using mean and, standard deviation, mean score from 2.50 and above were regarded as strongly agree. Below 2.50 were regarded as strongly disagree.

**RESULTS**

**Research question 1:** What are the preventive measures available for pathogenic organism that deteriorate yam-tubers in storage?

**TABLE 1:** Mean Response of the respondents on Pathogenic organism’s preventive measures:

S/N	Constructs	$\bar{X}$	SD
1	Disinfect yam tuber against termites that feed on it and pre-dispose organisms.	2.50	0.25
2	Disinfect yam tuber against crickets and other insects that feed on it and expose the tuber.	2.68	0.26
3	Avoid wounds on yam tuber during harvest with implement to prevent organism penetration.	2.56	0.29
4	Handle yam tubers with car during transparent to avoid bruises or wounds	2.50	0.25
5	Disinfect soil that is endemic with nematode.	2.93	0.21
6	Add calcium to soil to produce yam tuber with thick skin.	2.62	0.22
7	Use yam cultivar with resistance value.	2.80	0.21
8	Avoid different types of Nematodes.	2.81	0.22
9	Use refrigeration to prevent the growth of fungi	2.67	0.28
10	Disinfect yam-tuber storage, (Ban) with one percent ethanol (dissolved in alcohol)	2.93	0.21
11	Use ultra-violent lamp. ( A principles of Nuclear radiation),	2.80	0.22
12	Use hot air treatment.	2.67	0.27

All the item statement from 1-12 which dealt with the preventive measures available for pathogenic organism was accepted by the respondents. (Farmers), as effective ways of reducing the challenges of pathogenic organism on yam tubers.

**Research Question II:** What are the control measures for pathogenic organisms that deteriorate yam tuber in storage?

**TABLE 2:** Mean Response of the respondents on control measures of Pathogenic organism.

S/N	Constructs	X	SD
1	Planting Healthy seeds.	3.34	0.27
2	Remove infected plant stands, burn and bury,	2.51	0.20
3	Treat seeds with appropriate chemical	2.68	0.25
4	Store in dry condition with appropriate moisture content.	2.93	0.21
5	Use crop rotation system	2.54	0.20
6	Sort out infected ones from the rest.	2.82	0.21
7	Use chemical treatment	2.92	0.20
8	Destroy the host with inorganic materials (cuso <sub>4</sub> +caoH)	2.91	0.21

Data in table II show that all the item statement, which dealt with the control measures of pathogenic organism that attack yam-tubers were generally accepted by the respondents. (Farmers). As, effective measures which can reduce the attack of the organism on yam-tubers in Ebonyi State.

**Research Question III:** What are the management measures available for pathogenic organism that deteriorate yam tuber in storage?

**TABLE 3:** Mean Response of the respondents on management measures of pathogenic organism

S/N	Constructs	X	SD
1	The use of crop rotation as good management practices	2.80	0.21
2	The use of plant disease legislation	2.52	0.20
3	Maintaining soil water and nutrient relationship.	2.68	0.24
4	Plantings crops earlier in the field.	3.10	0.23
5	Quarantine,	3.62	0.27
6	Use of biological control method	2.93	0.20
7	Sanitation of the environment	2.50	0.25
8	Direct use of treated seeds.	2.52	0.27

Table III, show that all the item statement that sort information on the management measures available, against pathogenic organism that attacks yam-tubers and decay it were generally accepted, by the respondent (Farmers). Hence, all the item statement scored above 2.50, which is strongly agreed.

The following emerged as the findings of the study.

1. That pathogenic organism penetrate into yam-tubers when it is predispose through wound, burn, termite attack among others.
2. That preventive measures is a viable instrument, as, it was generally accepted by farmers, to be reducing the attack of pathogenic organism on yam tubers.
3. That control measure listed from item 1-8 in table two required strict adherence by the farmers, to control disease attack on yam-tubers stored.
4. That management measures enumerated in table III, need farmers' attention as routine exercise, to reduce pathogenic organism attack on yam-tubers during storage.

## DISCUSSION

The result of this study, in table 1, shows how effective the preventive measures can reduce the attack of pathogenic organisms and reduce the negative fight of the organism on yam-tubers. Avoid wondering yam-tubers, by farmers, during harvest, use of good yam cultivar, that resist disease, and use of chemical to disinfect such organism is a viable measure, since, prevention is better than cure. This study is in line with the study of Adeyola, (2009) who discovered that farmer's preventive measures against pathogenic organism attack on yam-tubers need serious planning and implementation. That without appropriate preventive measures farmers will record failure, to provide

enough food during scarcity. It is evidenced; that control measures against pathogenic organism that attack yam-tubers during storage is a vital instruments in reducing its decaying process, nutritive tendencies on yam tubers. This will help farmers to depend on yam-tuber for their wellbeing, as sources of income, sources of input, among others. This study is in line with the study of Afoke (2005) who said that yam-tuber production is positive enterprise, which you can depend on and make, reasonable money, and build better family. The study shows that management practices, improves farmer's technique in production and reduces the attack of pathogenic organism in his or her environment.

## CONCLUSION

The study concludes that farmers need to improve on their technique of yam-tuber storage-system. That yam-tuber storage, facilities need to be disinfected, appropriately, while storage routine practices need to be adhered strictly by the farmers. This is to enable farmers achieve their goal of making money from yam-tubers production, feeding well, and feeding Nigerian teaming population and reducing, hunger, poverty, disease, and other social vices.

## RECOMMENDATION

That preventive measures against pathogenic organism that attack yam-tuber during storage; need to be, inculcated to all the farmers, during workshop, seminars,

in their villages, in Ebonyi State. That government should give farmers essential chemicals for controlling, preventing and treatment of pathogenic organism that attack yam-tubers. Those farmers should adopt good management measure that can control and prevent pathogenic organism that attack yam tubers and decay them.

#### REFERENCES

Adeyola, S.C. (2009) Unpublished Lecture Notes and Mimeograph F.A.O. Programme 1985.

Afoke, N.S. (2005) Food Degradation and Pathogenic Organism in Developing Country. *Journal of Crop Science*, 5(2)15.

Akubuilu, O.F. (2008) Management Technique in Crop Production. Onitsha, EWACO, Publisher.

Anochili, B.C. (2009) Agricultural science for senior secondary school Onitsha, snap press.

Eze, P.E. (2009) The Principles of Plant Pathology (Onitsha Dunnee, Publisher.

Food value record (FVR, 2012) Food Record Analysis in the 21<sup>st</sup> Century. A Report of Current Food Value. Ibadan.

Nweke, F.O. (2008) Agricultural Storage Facilities in Africa: A Report to the Federal Dept of Agric, Land Resources. Ibadan.

Odo, J.U. (2008) Hand Book of Soil Disease, Awka, Snap, Publisher.

Ogba, E.I. (2005) The New Generation Agricultural Science. Enugu, Immaculate Publishers.

Okonkwo, R.O. (2010) The Economic Analysis of Pathogenic Organism on Crop Products. *Journal of Crop Science* 2(1)3.

Smit, R.N. (2000) The Principles of English Review. Ibadan, Dope Publisher. Limited

Statistical digest (2012) Farmer Record, Ministry of Agriculture and Natural Resource. Abakaliki

Ukwa, S.O. (2008) The Dynamic Approach to Crop Protection. Jos, Saudi Press.