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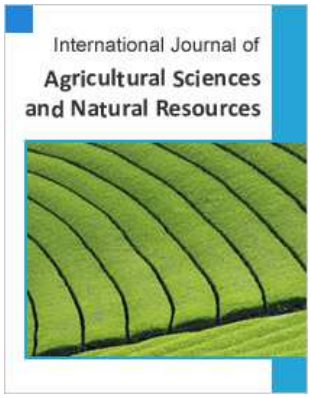

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Farmers' Awareness of the Existence of Crop Diseases in Etche and Ikwere Local Government Areas of Rivers State, Nigeria

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Abstract
A survey of farmers' awareness of the existence of crop diseases was carried out in four communities each in Etche and Ikwere Local Government Areas (LGAs), Rivers State, Nigeria. Due to lack of documented evidence on the awareness of crop diseases in these LGAs, this work was aimed at; identifying commonly cultivated plants in the areas, determining the level of awareness on diseases affecting these crops and also evaluate the level of adoption of disease management strategies by the farmers. A total of 100 farmers from each of the LGA were sampled. Data were collected with the use of structured questionnaire and analyzed using descriptive statistics. Results showed that all the farmers were involved in cassava cultivation in both LGAs. Other crops mainly cultivated were plantain, yam, maize, fluted pumpkin, cocoyam, melon, and okra. Leaf spot and yellowing of leaves were the major disease conditions identified by the farmers. Farmers in Etche called leaf spot "*Nkpomkpo*" while farmers in Ikwere called leaf spot "*Okwukwo chaghari odoodoo*". Field inspection, crop destruction, cutting off of affected plant parts were the major management strategies adopted by farmers in both LGAs. However, farmers were aware of some of these abnormal conditions but they only attributed it to curses from the gods.

1. Introduction

Lack of awareness and varying perception has greatly influenced farmer's behavior in solving some of their production constraints in the developing nations (Nangoti et al., 2004). In Nigeria for instance, majority of consumed foods come from the rural areas and it is important that the effects of disease if given adequate attention will aid in crop loss reduction in these areas. For most poor farmers, there is inadequate knowledge of the existence of control measures and this has resulted in heavy crop losses. Substantial losses to yield due to crop diseases occur in most of the agricultural crop species (Fagwalawa et al., 2013). For example; in Nigeria 25 million Naira was lost when about 70 % of the cocoa produced was lost to black pod disease in 1995 (Kutama et al., 2011a&b) and tuber rots according to Taiga (2011) resulted in loss of 7 million MT of yams annually. Cocoyam is seriously affected by tuber rot caused by *Sclerotium rolfsii* and this disease had resulted in 11% drop in cocoyam (Nwachukwu and Osuji, 2008). More than 75% of these crops diseases are caused by fungi (Kutama, 2012). Some farmers havegenuine problem of insufficient awareness and information on plant disease especially in the rural

communities of Nigeria. Moreover, for farmers to have good disease management strategies, they have to be aware of the existence of crop diseases that cause reduction in yield. In view of this, agricultural specialists have a great role to play in the dissemination of useful information on crop diseases with a view to sustaining farmers thereby ensuring food security for the rural communities in particular and for the nation in general. Since farmers in Etche and Ikwere local government area contribute immensely to food production in Rivers State, south southern Nigeria, information on agricultural related issues in both Local Government Areas through the extension system needs to be intensified. It would be useful to crop scientists and farmers in addressing the problems of crop diseases especially in the rural communities. Farmers would be aware of the problems of crop disease and as well as adopting the appropriate management strategies to deal with the disease. Etche and Ikwere ethnic nationalities lie at the north-east of Rivers State towards the southern portions of Imo and Abia States, all in Nigeria and their population stands at between 400,000 – 600,000 people (National Population Commission, NPC, 2006). Because of the surrounding rivers and their branches traversing the large plains of Etche and Ikwere ethnic nationalities, rendering the soil fertile for agriculture; hence the main occupation of the people is farming (Ihejirika, 2012). The peoples' widely cultivated crops include; cassava, yam, cocoyam, plantain, maize, melon, vegetables and fruits, but lack of modern knowledge of agricultural practices has continually kept production low with high level of poverty among the people (Ihejirika, 2012). Amirize (2002) noted that most families live below poverty line because they are engaged in farming that uses local technology, little specialization, limited exchange and low productivity. However, lack of awareness on crop diseases and management strategies had increasingly led to poor productivity of these crops. The literature is silent on crop disease awareness in both Etche and Ikwere Local Government Areas, hence the need for this study. The objective of this research was to identify commonly cultivated plants in these areas and also assess farmers' awareness of existence of crop diseases and possibly local management strategies adopted to reduce the effects of these diseases.

2. Methodology

2.1. Description of the Study Area

The study was carried out in Etche and Ikwere Local Government Areas of Rivers State as shown in Figure 1. Etche and Ikwere are two of the 23 Local Governments in Rivers State. The capital of Etche Local Government area is Okehi while that of Ikwere Local Government Area is Isiokpo.

Figure 1. *Map of Rivers State showing with arrows the study areas.*

2.2. Sample and Sampling Technique

One hundred (100) farmers were selected from each of the Local Government Areas to make a total sample of two hundred (200) farmers. The random sampling technique was used to select the farmers in the four farming communities. Questionnaires were administered to the identified farmers. The four communities in Ikwere Local Government Area were Omagwa, Aluu, Igwuruta, Ozuoha, while the four communities in Etche Local Government Area were Chokocho, Ulakwo, Umuechem and Egwi.

2.3. Method of Data Collection

Data collection was by a structured questionnaire. Data was collected on household size, production characteristics of farmers, common crops cultivated, knowledge level of plant disease affecting crops and management strategies adopted by farmers. Interviews and field observation was also used to take care of the areas that were not taken care of by the questionnaire. Data collected was analyzed using descriptive statistics.

3. Results

Table 1. *Common crops cultivated in Etche and Ikwere Local Government Areas.*

Crop	Percentage (%) ELGA	KLGA
Cassava	100	100
Plantain	92	76
Yam	90	78
Cocoyam	84	86
Maize	90	86
Pumpkin	86	84
Potato	0	0
Pepper	64	70
Cucumber	78	72
Tomato	0	0
Garden egg	14	70
Carrot	0	0
Water melon	0	0
Melon	90	78
Cowpea	0	0
Okra	90	96

Key: ELGA = Etche Local Government Area
KLGA = Ikwerre Local Government Area

Data showed that cassava was widely cultivated in Etche and Ikwere Local Government Area and all the farmers were involved in the cultivation (Table 1). Plantain, yam, cocoyam, fluted pumpkin, pepper, cucumber, melon, and okra were all cultivated by the farmers at varying degrees in both LGAs. Cowpea, tomato, carrot, water melon were not among the widely cultivated crops in the two LGAs. Leaf spot (96% and 80%), respectively were the major disease conditions affecting crops in Etche and Ikwere Local Government Area with wider awareness (Table 2 and 3). Leaf spot has the highest awareness among farmers in the two LGAs. Root and stem rot had varying degrees of awareness in the two LGAs with higher awareness in Ikwere LGA.

Table 2. *Knowledge level of farmers about diseases affecting crops in Etche Local Government Area.*

Disease condition	VS (%)	MS (%)	LS (%)	Mean
Leaf spot	96	4	0	2.96
Yellowing	78	22	0	2.78
Death of plant	42	6	52	1.96
Browning of tissue	16	8	76	1.40
Root and stem rot	52	8	40	2.12
Fruit rot	44	6	50	1.94
Fruit shrink	56	0	44	2.12
Leaf shrink	36	12	52	1.84
Leaf and fruit drop	16	12	72	1.44
Twisting and curling of leaves	28	8	64	1.64
Poor harvest	74	0	26	2.48
Leaf hyperplasia	28	8	64	1.64
Swollen roots (gall)	14	2	84	1.30
Black leaves	22	0	78	1.44
Black root	6	0	94	1.12

Key: VS = Very serious, MS = Moderate, LS = Less serious

Table 3. *Knowledge level of farmers about diseases affecting crops in Ikwere Local Government Area.*

Disease condition	VS (%)	MS (%)	LS (%)	Mean
Leaf spot	80	20	0	2.60
Yellowing	76	20	4	2.76
Death of plant	60	18	22	2.56
Browning of tissue	8	16	76	1.32
Root and stem rot	64	20	16	2.48
Fruit rot	16	8	76	1.40
Fruit shrink	58	18	24	2.34
Leaf shrink	62	0	38	2.24
Leaf and fruit drop	10	2	88	1.22
Twisting and curling of leaves	22	6	72	1.50
Poor harvest	80	0	20	2.60
Leaf hyperplasia	28	8	64	1.64
Swollen roots (gall)	14	2	84	1.30
Black leaves	24	0	76	1.48
Black root	14	0	86	1.28

Key: VS = Very serious, MS = Moderate, LS = Less serious

The shrinking of fruit was also observed by the farmers in the LGAs at varying levels. Farmers also associated most death of plants and poor harvest to crop abnormalities and this was common in both LGAs. Also diseases like fruit rot, leaf shrink, twisting and curling of leaves and browning of tissue all had varying degrees of awareness among farmers in the two LGAs with some disease higher in one LGA than the other (Table 2 and 3). Results also showed that the main management strategies adopted by farmers in Etche and Ikwere LGAs was crop destruction, cutting off of affected tissue and field inspection (Table 4 & 5). These practices were commonly adopted by farmers in both LGAs. Farmers also adopted management strategies such as disinfection, early and late harvesting and burning although at low levels. Furthermore, because of scarce resources, management strategies such as the use of chemicals, natural enemies, crop rotation and shifting cultivation were not practiced by the farmers in the two LGAs. Verbal interviews revealed that

respondents believed that diseases are part of the normal growth process and /or curses from the gods.

Table 4. *Management strategies adopted by farmers in Etche Local Government Area.*

Management strategies	VI (%)	IM (%)	LI (%)	Mean
Use of natural enemies	0	0	0	0
Nematicide	0	0	0	0
Fungicide	0	0	0	0
Inspection	100	0	0	3.00
Disinfection	34	0	66	1.68
Cleaning of planting material	0	0	0	0
Crop rotation	0	0	0	0
Resistant varieties	0	0	0	0
Shifting cultivation	0	0	0	0
Early harvesting	28	0	72	1.56
Crop destruction	100	0	0	3.00
Cutting off of affected tissue	100	0	0	3.00
Burning	38	0	61	1.76
Late planting	14	0	86	1.28
Late harvesting	0	0	0	0
Flooding	0	0	0	0
Ploughing and harrowing of soil	0	0	0	0

Key: VI = Very Important, IM = Important, LI = Less Important

Table 5. *Management strategies adopted by farmers in Ikwere Local Government Area.*

Management strategies	VI (%)	IM (%)	LI (%)	Mean
Use of natural enemies	0	0	0	0
Nematicide	0	0	0	0
Fungicide	0	0	0	0
Inspection	100	0	0	3.00
Disinfection	28	0	72	1.56
Cleaning of planting material	0	0	0	0
Crop rotation	0	0	0	0
Resistant varieties	0	0	0	0
Shifting cultivation	0	0	0	0
Early harvesting	14	0	86	1.28
Crop destruction	100	0	0	3.00
Cutting off of affected tissue	100	0	0	3.00
Burning	32	0	68	1.64
Late planting	6	0	94	1.12
Late harvesting	0	0	0	0
Flooding	0	0	0	0
Ploughing and harrowing soil	0	0	0	0

Key: VI = Very Important, IM = Important, LI = Less Important

4. Discussion

The low level of knowledge on improved practices, low use of certified seeds and fertilizer, lack of irrigation facilities, ineffective policies, lack of incentives and incidence of diseases which are not adequately addressed by farmers have all contributed to low agricultural productivity in most developing nations (Aseno-Okyere and Jemaneh, 2012). Rural farmers concentrate production on the staple foods common in the locality and most of these crops are affected by same diseases.

This practice has contributed to the high level of crop diseases occurrence commonly observed in the rural farms. The high level of cassava cultivation among farmers in Etche and Ikwere Local Government Area as obtained in this study shows the importance of cassava as a major staple food in these areas. The cultivation of plantain and cocoyam at higher levels is also an indication that these crops formed part of the staple as well as source of income to the farmers. However, garden egg and pepper were cultivated for their domestic use, while potato, tomato, carrot, water melon, cowpea cultivation were not largely practiced by the farmers due to poor adaptability of these crops to the areas. Moreover, the awareness level of crop diseases by farmers was very high in terms of indigenous knowledge but the scientific implication was lacking. For example leaf spot was called "*nkpomko*" in Etche and *"Okwukwu Ichaghari Odoodoo"* but farmers were not aware that this was detrimental to their crops. The higher awareness of this disease could be because of the visible spots commonly associated with the affected leaves.

Other diseases in the indigenous knowledge system were;

i. Death of crop in Etche was called "Onwu Osisi".
ii. Death of crop in Ikwere was called "Enwu nkpara Okwukwu"
iii. Root and stem rot was called "Oruroo egwugwu"

Going by the indigenous knowledge system, farmers in Ikwerre Local Government Area were more aware of crop diseases than farmers in Etche Local Government Area but the implication of the effects of these diseases on crop yield was lacking in both Local Governments. They strongly believed that crop diseases and failures were as a result of curses from the gods. In general, this belief has greatly influenced the level of adoption of disease management strategies, thus the high occurrence of crop diseases in these areas.

5. Conclusion and Recommendation

The following conclusions were drawn from the study:

- Farmers in the study areas have indigenous knowledge of some plant diseases but the scientific interpretation was lacking.
- Farmers did not see disease as a problem as they did not relate the diseases to crop failure.
- Farmers, even though used disease management strategies, were not aware that the strategies were being used to curtail diseases.
- There should be organized workshops for the enlightenment of farmers in Etche and Ikwerre Local Government Areas on the adverse effects of diseases on crop yield.
- Farmers should be trained on various management strategies of crop diseases.
- Farmers in both LGAs should be aided on the adoption of crop disease management measures.

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