

VEGETABLE CROPS OF PERI – URBAN FARMS ALONG JAKARA RIVER AND ASSOCIATED INSECT PESTS

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ABSTRACT

This study was carried out to identify vegetable crops cultivated and insect pests attacking them in Peri–urban farms Jakara River, Kano. Field visits, direct interviews and questionnaires were the tools used for data acquisition. Eight vegetables crops were identified while beetles, butterfly larvae and weevils were attacking the vegetables. This study was so important that it provides essential data that would help to boost vegetable production and a better method for pest control. Cultivation of highly marketable and insect-resistant vegetables was recommended in the study area. This has also predicted handpicking as the best method for pest control in the study area.

Keywords: *Beetle, Cultivation, Pests, River, Vegetables*

INTRODUCTION

Peri–urban crop farming is a popular practice which attained a remarkable change over years in Kano close–settled zone. History of cultivation activities around the zone dated back some hundred years ago. Although no available records of the early farming activities in the area, several farmers interviewed confirmed that the cultivation dated back several decades (Personal communication, 2011).

Vegetable farming has been enhanced by favourable environment condition, readily available market and adequate water supply. The Jakara River system, now substituted by domestic and industrial wastewaters (Binns *et al.*, 2003) which drains along Kwakwachi, Jagule, Gayawa, Gama–Kwari, Fanisau, Wase and Minjibir encourage the practice (Adamu and Basse, 2010). Today thousands of farmers are engaged in crops cultivation in the area. The practice had contributed immensely in regular supply of vegetables that are mostly marketed and consumed within the city and its environs.

Vegetables are important part of healthy eating and provide a source of many nutrients including potassium, fibre and folates (folic acid and vitamin A, E and C). Their daily diet has a reduced risk of many chronic diseases. Potassium may help to maintain healthy blood pressure. Dietary fibre from vegetables helps reduce blood cholesterol levels and may lower risk of heart disease. Folate help the body form healthy red blood cells. Woman of childbearing age who may become pregnant and those in the first trimester of pregnancy need adequate folate to reduce the risk of neural tube defects and spinal bifida during fetal development (ChooseMyplate, 2015).

However, it is commonly observed that insects and or other animals referred to as pests destroy plants or food and consequently this leads to lower production and poor quality in

plants. Pests attack crops and decrease their production. To affect production appreciably, a given pest must be present in large numbers (Sarojini, 2007). Pests of crops feed on various parts of crop them thereby affecting their growth.

In the past, farmers grew several types of crops on their farms (Personal communication, 2011). This practice kept pest under control. However, today, a large percentage of agricultural land is under monoculture. The growing of the same type of plant, such as vegetables, year after years, allows its pest to continue living and breeding unchecked (Sarojini, 2007).

To effectively control pests, their identification, habits and life cycles are important. Therefore, this study is aimed at identifying vegetable crops and insect pests associated with so as to design suitable control measures.

Materials and Methods

Study Area

The area is located at the North – east of Kano, 12° 25N and 8° 38E and the present climate of the study area is the tropical wet – end – dry type which is characterized by a wet season which lasts between June and September during which about 800mm of rain fall (Nabegu, 2010).

The study area lies along Jakara River system which runs along Kwakwachi, Sabon – Gari, Jagule and Fanisau all in Dala, Fagge, Nassarawa and Ungoggo Local Government Areas of Kano State. The farm land covered about 5000 hectares.

Substantial vegetable production takes place on both banks of the River and crops are irrigated by water from the river, which forms northern watershed of Kano (Imam, 2011).

Sampling Technique

The cultivated farm lands on the river bank were used for sampling (Maharazu, 2010). Twenty farm plots were selected along the river side using stratified sampling; selecting a farm plot after every two plots and visited every other day. In these, both vegetables and pests were simultaneously collected. Hand picking and use of sweep net were both employed for collection of both larvae and adult insects.

Samples Identification

The vegetables sampled were identified according to the keys of Dutta (1969) and were further grouped according to the span of their life cycles as annual, biennial and perennial (Sarojini, 2007).

Interview and Questionnaire Administration

Oral interviews were conducted with farmers throughout the period of study and they aimed at extracting all the necessary information about the history of vegetable production, types and the insect pests attacking them among others. Also structured questionnaires (Chukwu, 1994), which sought for the similar information in interviews were distributed to farmers.

Statistical Analysis

Statistical Package for Social Science (SPSS) software was used to analyse the data obtained from the questionnaires distributed to farmers. The P-value was set at $P \geq 0.05$

Results

Table 1: Identified Insect Pests attacking vegetable crops

Beetle <i>Bledius spectabilis</i>	Order: Coleoptera, Agriotes species. The body is small, round and flat in shape with soft pair of wings. The wings are red with black spots.
Butterfly (larval stage, caterpillar) <i>Papilio glaucas</i>	Order: Lepidoptera, Hydraecia species. Is a campodei form of larvae, The body is segmented and green to brown in colour with pair of legs. It has definite mouthpart and hairy projections all over the body. The colour ranges from brown to green depending on age.
Weevil <i>Sitophilus granarius</i>	Order: Coleoptera, species <i>Gamites lineatus</i> . Is medium in size with heavily thickened body, with long feeding mouthpart facing forward (prognathus). It is ash in colour. It is usually small less than 6 mm and are herbivores.

Table 2: Identified Vegetables

English/Comm on Name	Botanical Name	Uses	Nutritional Constituents	Edible Parts	Leaf Arrangement	Type of leaf	Height of the plant at maturity	Period of maturity
Tomato	<i>Lycopersicon species</i>	Spice and food	Minerals Fe, Ca, Mg vitamins A,B, &C	Fruits	Pinnate	Foliage	35cm	Annual
Pepper	<i>Capsicum species</i>	Spice	Fe, Ca, Mg	Fruits	Bipinnate	Foliage	28cm	Annual
Cabbage	<i>Brassica oleracea Var.</i>	Food component	Mg, Ca, Fe Vitamins A, B, E, &C	Leaves	Pinnate	Foliage	45cm	Annual
Amaranthus	<i>Amaranthus caudatus L.</i>	Spices	Fe & Ca Vitamins A,B, & C	Leaves	Unipinnate	Foliage	50cm	Annual
Garden egg	<i>Solanum melongena</i>	Food	I, Vitamin C	Fruit	Palmate	Foliage	40cm	Annual
Cauliflower	<i>Brassica oleracea Var.</i>	Spices	Vitamin A	Leaves	Unipinnate	Sessile	27cm	Annual
Lettuce	<i>Lactuca sativa L.</i>	Food component	Vit.A,B,C. Fe,ca,Mg	Leaves	Pinnate	Foliage	46cm	Annual

e	Okra	<i>Hibiscus Esculentus L.</i>	Spices	Vit .A ,B,C. Mg,Ca,Fe	Fruit	Palmate	Sessile	70cm- 1m	Annual
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Discussion

Pest is an insect or animal that destroys plants (Hornby, 2001). Pests cause damage to vegetables by feeding. They often occur in high densities making the damage they do even more detrimental (Merriam, 2012). Similarly, the findings of this study reported three insect pests destroying vegetable crops and were found cluster on the vegetable leaves. The extent of this destruction is not assessed in this study.

It was observed that the pests identified were selective in destruction. For example, butterfly larva attacks Amaranthus, cabbage, and garden egg while beetle and weevil attack Cauliflower, Tomato, Waterleaf, Okro and pepper. Similarly, Butterfly larvae are dominant pests of Amaranthus, Cabbage, etc and was described as the most dangerous and active pest. More insect pests likewise, Sarojini (2007) cited that the most important animal pests are insects. When egg of butterfly hatches, the larva (caterpillar) emerges and will start his work and eat the leaf they were born onto. Caterpillar needs to eat and eat so as to grow quickly.

It was realized from this study that both the weevil and beetle from the study area are morphologically related and this agreed with finding by Kuschal (1995) that a weevil is a type of beetle from Curcudionoidea super family. Primitive weevils are distinguished by having straight antennae, while true weevils have elbowed antennae. They are usually small and herbivorous. Many weevils are damaging to crops. They are often found in warm-weather areas, but do survive in colder areas if they have already infested the plants.

Eight vegetables were identified in this study. All the vegetables were annual type. These showed that vegetables are frequently produced and this may be attributed to high demand. The result showed that vegetables are produce in accordance with demand and economic value. It was found that Amaranthus, lettuce and cabbage are produced most; pepper, cauliflower and okra are moderately produced; while garden eggs and others are produce in small quantities. There is a significant difference among production of the vegetables, $P < 0.05$

Furthermore, this study had compared the practical sampling of vegetables and the allied pests with the oral interviews and questionnaire and at the end both the information agreed with one another. Statistically, there is no significant difference, $P > 0.05$

This study predicts **handpicking** for pest control as same was employed for sampling. The use of human hand to remove harmful insects or other toxic materials is often the most common action by gardeners. It is also classified as the most direct and the quickest way to remove clearly visible pests (Oisat, 2012). However, it also has equal disadvantages as it must be performed before damage to the plant has been done and before the key development of insects.

Conclusion

This study had established data with regard to pests and vegetables of farms along Jakara River and this will form basis for other dimensional researches in the area.

Recommendation

Further research on pattern of destruction (stem, borers, root feeders, leaf feeders, etc) by the pests; extent of destruction; and pest control technique are strongly recommended.

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