



Assessment of Students' Knowledge about Pests in School Gardens of National Horticultural Research Institute's Adopted Schools in Oyo State

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Abstract

The study assessed students' knowledge of pests' infestation in school gardens in NIHORT adopted schools in Oyo state. Thirty percent of Junior Secondary School 3 students in two adopted schools were purposively sampled. Data were collected from 160 students using structured questionnaire and analyzed using descriptive statistics Horticultural (okra, jute mallow, mango, and pineapple) and arable (maize and cassava) crops are grown in the school gardens. Students (98.1%) are aware of pests and diseases infestation. Knowledge of the effects of pests and diseases shows that 43.1%, 31.3% and 16.3% of the students were able to deduce that it leads to reduction in produce quality, causes damages to crops and reduce crops growth respectively. Pests were observed in maize, cassava, okra and Corchorus by 53.8%, 48.1%, 21.9% and 5.6% of the students respectively. Insect pests mostly noticed were rodents (78.5%), grasshopper (72.4%), butterfly (52.8%) and snail (49.1%). Leaves were the most affected plant parts as observed by 89.4% of the students. Chemical treatment is mostly used for insect pest while controlled environment through fencing is mostly used for animal pests. Source of recommendation for treatment of pests' infestation on school gardens crops were mostly teachers (53.8%). Non-chemical control measures should be encouraged to control insect pests. There should be an enhancement of students' knowledge on harmful effects of pest and diseases in school gardens.

Key words: Students knowledge, pests, crops grown, school garden

INTRODUCTION

School gardens give students the opportunity of engaging in practical agriculture through hands-on experience (Hayden-Smith, 2010). School gardens allow students to become active participants in learning process, gain understanding of ecosystem, an appreciation for food origins and nutrition as well as knowledge of pests and diseases. It also supports inquiry, connection to the natural world and engages students in the process of formulating meaningful questions (Habib and Dohert, 2007).

Pests and diseases are an age long problems of agriculture. Pests constitute threat to crops and animals at different stages of life (Adesina *et al.*, 2014) or property. Fruits and vegetables are common in school gardens and these form part of a healthy diet because they provide vitamins and minerals (Eke *et al.*, 2008). Biotic and abiotic factors are among the major constraints of fruit and vegetable

production. Rain, heavy dews, warm temperatures, and dry climates have been reported as principal conditions that favor establishment of pests and diseases (Landston and Eaker, 2009). Youdeowei (2002) indicated that biotic constraints caused significant economic loss on vegetables in Ghana. In Cameroon, pests and diseases have been identified as major constraints to vegetable production (Ellis-Jones *et al.*, 2008). Iwuchukwu and Uzoho (2009) indicated that the most important financial constraints associated with vegetable production in Enugu State, Nigeria, were caused by the laborious nature of vegetable production and incidence of pests and diseases. Pests and diseases can cause both economic and health problems for farmers. Animal pest can feed on leafy vegetables and seeds thereby causing great damage on crops. Damage by insect pests mostly leaves openings or wounds on crops which could serve as points of entry for pathogenic



organisms. Pest and disease incidence could also be a major challenge in school gardens especially if students cannot identify pests and diseases infestation on crops. If no preventive and curative measures are in place, pest infestation could rise above threshold level which can cause economic damage and yield loss. In view of this, the study assessed knowledge of students about pests and diseases in school gardens in National Horticultural Research Institute (NIHORT) adopted schools. Specific objectives of the study are to:

- i. Determine crops grown in school gardens in NIHORT adopted schools
- ii. identify common pests and diseases in school gardens
- iii. ascertain students' knowledge on the effect of pests and diseases on crop plants
- iv. determine crops affected/ plant part mostly affected based on students observation

METHODOLOGY

The study was carried out in Ibadan, Oyo state. The sampling involved a purposive selection of two adopted schools of NIHORT in Ibadan - Saint Teresa's College, Oke-Ado and Baptist Grammar School, Idi-ishin. Thirty percent of the Junior Secondary School 3 students in the two adopted schools were randomly sampled for the study. This gave a total of 160 students with 100 students and 60 students from Saint Teresa's College and Baptist Grammar School respectively. Structured questionnaire was used to elicit information from the students. The total number of students sampled from both schools was one hundred and sixty. Descriptive statistics such as frequencies and percentages were used to analyze the data collected.

RESULTS AND DISCUSSION

Crops grown in the school gardens

The results on Table 1 reveals that both fruits (plantain, mango, pawpaw, pineapple and cashew), leafy and fruit vegetables (amaranthus, jute mallow, okra and tomato) food and root crops (cassava, potato and maize) as well as groundnut form the arrays of crops grown in both schools. Specifically, maize, okra, jute mallow, groundnut, potato, plantain and tomatoes were grown in one of the adopted schools while fruits such as mango, pawpaw, pineapple and cashew and cassava form the bulk of crops grown in the second schools. In a school garden at Andhra Pradesh state, India, crops grown include tomatoes, carrots, chillies, amaranth, Indian spinach, moringa, maize (Konmu, 2010). Vegetables commonly grown in the school gardens could be due to the fact that they are short duration crops that can be cultivated and harvested within twelve to fourteen weeks that make up a term. Availability of fruit trees in the school is a potential that could be a means of improving nutrition of students in the adopted schools.

Pests observed by students in school gardens

The most common pests in school gardens identified by the students were grasshopper (78.5%), rodent (72.4%), beetle (63.1%), butterfly (52.8%) and snail (49.1%). This is an indication that grasshoppers are more prevalent in school gardens in the study areas. The green nature of vegetable may be the reason for high incidence of grasshopper infestation in school gardens. Akinkunmi *et al.*, 2017 reported that grasshoppers are polyphagous insect and can feed on any crop species. Rodent and grasshopper are common pests of root crops and vegetables. Snail pest can be very destructive on leafy vegetable and some fruit crops. It can sometimes act as vector or carrier of disease pathogens. Human pest (30.79%) was also experienced in school gardens



Awareness of the effect of pests and diseases infestation on crops

Most of the students (98.1%) are aware of the presence of pests and diseases in their school gardens. Most of the students were able to identify the observed insect pests but were unable to identify diseases on the crops in their school gardens, this suggests the reason why no disease was mentioned by the respondents. Considering the effects of pests' infestation on crops, 43.1% of the students believed it could lead to reduction in produce quality, 31.3% opined it could cause damage to crops while only 16.3% agreed it could bring about a reduction in crop growth (Table 2). The implication of this is that students are aware of pest and disease in school gardens but are not fully knowledgeable on the identification of disease symptoms on garden crops.

Crops and plant parts affected by pests in school gardens

Based on students' observation, 53.8% observed pest on maize planted in school gardens, 48.1% noticed pest attack on cassava. However, 21.9% and 5.6% of the students observed pest infestation on okra and *Corchorus* respectively. The major plant part attacked by pests as identified by 89.4% of the respondents was the leaves (Table 4).

Personnel who recommended treatment

Chemical control method was the main participatory pest control measure used in both school gardens surveyed. The results showed that the recommended treatment for pests' infestation was done majorly by the teachers (53.8%) (Table 5). This is a strong indication that teachers' knowledge should be upgraded from time to time with the current trend in pest and disease control using integrated pest management (IPM). This is to ensure production of safe food and maintenance of healthy environment. Use of chemical pesticides should be the last resort. To enhance food quality and safety, chemical pesticides and

dosages should be strictly adhered to according to manufacturer's recommendations. All research institutes and necessary stakeholders should put appropriate feedback mechanism in place for effective monitoring of adopted schools. Monitoring and inspecting for rodent infestation provides the opportunity to identify rodent-conducive conditions before rodent begins infestation activities, rodent signs to watch out for includes droppings, gnaw damage, burrows, runways, tracks, grease or rub marks, urine stains, sightings of live or dead rodents, rodent sounds, and rodent odors (Environmental Protection Agency, 2017). Traps are used to control rodents and grasscutters because they live in the wild and attacked school gardens while snails are controlled in school garden by hand picking. Fencing is used to control livestock pests such as sheep, goat and cattle. Hence, animal pest control can be achieved absolutely with fencing facility.

CONCLUSION AND RECOMMENDATION

Leafy vegetables, fruits, root crops and legumes form the arrays of crops grown in both schools. Most students were aware of the presence of pests and diseases in their school gardens. However, less than average number of the students believed pest and disease infestation could lead to reduction in produce quality, cause damage to crops and bring about reduction in crop growth. Grasshopper and rodents were identified as the most common pests in the school gardens surveyed. Damage by pests was mostly on the leaves of the crops. For school gardens to enhance sustainable environment, conscious effort should be made to train teachers and students on identification of pests and diseases in school gardens and the need to adopt integrated pest management techniques to combat pests in school gardens.

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Table 1: Crops grown in the school gardens

School	Common Crops grown
School 1	okra, jute mallow, groundnut, potato, plantain, tomato, mango, Cassava, Maize,
School 2	Okra, mango, pawpaw, pineapple, cashew, Yam, cassava

Source: Field Survey, 2018

Table 2: Awareness and knowledge of the effect of pest and disease among students

	Variable	Frequency	Percentage
Awareness	Awareness of pest of garden plants	157	98.1
	Awareness of disease in garden plants	157	98.1
	Observation of pest in school garden	157	98.1
	Observation of diseases in school garden	157	98.1
Knowledge	Reduction in produce quality	69	43.1
	It reduces crops growth	26	16.3
	It damages/destroys the crops	50	31.3

Source: Field Survey, 2018

Table 3: Frequency distribution of pests observed by students in the school gardens

Insect pest notice by students	Frequency	percentage
Grasshopper	128	78.5
Rodent	118	72.4
Beetle	19	11.7
Aphids	1	0.6
Butterfly	86	52.8
Whitefly	2	1.2
Human	50	30.7
Snail	80	49.1
grass cutter	52	35.6
Sheep	48	29.4
Larvae stage of some insects	43	26.4
Poultry	8	4.9
Goat	57	35.0
Cow	0	0

Source: Field Survey, 2018



Table 4: Crops affected by pests in school gardens

Crops affected by pests	Frequency	Percentage
Maize	86	53.8
Okra	35	21.9
Cassava	77	48.1
Corchorus	9	5.6
Plant parts affected bypests		
Leaves	143	89.4
Fruits	7	4.4
Stem	4	2.5

Source: Field Survey, 2018

Table 5: Personnel who recommended treatment

Treatment recommendation	Frequency	Percentage
Teacher	86	53.8
Agrochemical dealer	1	0.6
Research institute	4	2.5

Source: Field Survey, 2018