

## **SURVEY ON AWARENESS OF FALL ARMYWORM AND THE EFFECT ON THE YIELD OF MAIZE (*ZEA MAYS L*) PRODUCTION IN YEWA SOUTH LOCAL GOVERNMENT, OGUN STATE**

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### **ABSTRACT**

Fall Armyworm (FAW) infestation in Africa countries presents significant threats to maize production in Nigeria. Such infestation has major economic implications in terms of the cost of measures taken at individual and international levels. One hundred and seventy seven (177) sample of questionnaire was prepared for those villages in Yewa South Local Government Area of Ogun State and a total of one hundred and thirty three (133) questionnaires was recovered from the field. The socio economic characteristics of the study shows that 88% of the respondents are men, 85% of the farmers are married and 39.1% have their level of education up to the secondary school level. Also 84.2% of the respondents adopted the intercropping system of planting. The study shows that most farmers were not aware of the pest called fall armyworm (*Spodoptera frugiperda*) due to lack of equipment /chemicals coupled with illiteracy. If only the agricultural extension agent can be of help to farmers in organizing a formal education to innovate and train the farmers on how to operate the equipment, the quantity of chemicals to be used in reducing the invasion of the pest thereby increasing maize production.

**Keywords:** *Spodoptera frugiperda*; maize production; extension agent; formal education

### **INTRODUCTION**

Maize (*Zea mays,L*) belongs to the family *Poaceae*, it is one of the main cereal crops of West Africa. It is the fourth most consumed cereal during the past two decades, after sorghum, millet and rice in Nigeria (FAO 2008). It is one of the most important staple foods in the world today. Maize is also the most important staple food in Nigeria and it has grown to be local ‘cash crop’ most especially in the south-western part of Nigeria where at least 30% of the crop land has been devoted to small-scale maize production under various cropping systems. Nigeria is the leading producer of maize in the West Africa sub-region and the tenth largest producer in the world (FAO, 2017). In 2018, about 10.2 million tons of maize was produced from 4.8 million hectares, making Nigeria the highest producer in Africa (FAO, 2018). Maize is the world’s highest supplier of calorie with caloric

supply of about 19.5%. It provides more calorie than rice (16.5%) and wheat (15.0%). Maize is the most important staple cereal crop grown by small farm holders in sub-Saharan Africa (Macauley, 2015). In Africa, the major portion of maize produced worldwide is used for animal and human consumption because it’s a source of protein and calories.it is a source of important vitamins and minerals to the human body (Shiferaw *et al.* 2011).

The most important pest of maize is the Fall Armyworm (FAW), *Spodoptera frugiperda* (Lepidoptera: Noctuidae), considered a native pest in the tropical and sub-tropical Americas (Early *et al.*,2018). On the African continent, FAW is among the most destructive invasive pests. The larvae, which are light green to dark brown with longitudinal stripes feed in large numbers on the leaves, stems, and reproductive parts of plants. The pest affects more than 350 plant species causing severe

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damage to cultivated crops, such as maize, rice, sorghum, sugarcane (Day *et al.*, 2017). In Nigeria, FAW was first reported in Oyo and Ogun states in 2016. Currently, the pest is present in all the states of the country as well as the Federal Capital Territory (FCT). Losses up to 100% have been recorded in some farmers' fields.

The purpose of this survey is to evaluate the level of awareness of the maize farmers of Yewa south local government on the pest Fall Armyworm and to evaluate the effect of the pest on the yield and production of maize.

## **MATERIALS AND METHOD**

### **The study area**

The study was carried out in Yewa South Local Government Area of Ogun State. The three main religions – Christianity, Islam, Traditional Religion are well practiced. Yewa South Local Government is naturally endowed with large expanse of land measuring about 163,750 hectares, and a population of 168,850 according to the 1991 provisional censuses. The people of Yewa South Local Government Area are predominantly farmers and traders while a few people engage in craftsmanship. The main crops grown in the area include cassava, yam, palm kernel, maize, cocoa, bread fruit, melon, cocoyam, Aparapa, pepper, kolanut, vegetables and fruits.

### **Population of the study**

The population of this study was the farmers in Yewa South Local Government Area of Ogun State.

### **Materials and method Participatory Rural Appraisal in Yewa South Local Government Areas.**

A total number of one hundred and thirty three (133) farmers in Yewa South Local Government Areas of Ogun State was

surveyed in respect of their perceptions of the status of their maize farm.

### **Sampling procedure and sample size**

Multi-stage sampling technique was used to select the respondents for the study. The selection was as follows:

Stage 1: Out of the blocks in Yewa South Local Government Area of Ogun State, villages were selected randomly from each of the blocks.

Stage 2: Respondents from each of the villages were randomly selected. Making total of 133 respondents.

Stage 3: One hundred and thirty three (133) sample of questionnaire was prepared for those villages in Yewa South Local Government Area of Ogun State.

### **Method of data collection**

Primary data was collected with the aid of interview guide.

### **Statistical analysis**

In order to achieve the objectives of this study and test the research hypotheses, the data collected was subjected to both descriptive and inferential statistical analysis using Statistical Package for Social Sciences (SPSS). Descriptive statistic such as percentage, mean and frequency distribution was used to describe the socio-economic characteristics of the villagers while inferential statistics that were utilized are multiple regression analysis. The empirical model that was used in the study is specified as follows:  $Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \dots + \beta_k X_k + e_i$

Where

$B_0$  = Constant

Y = Maize Yield (kilogram)

$X_1$  = Awareness of Fall Army Worm

X<sub>2</sub>= Attempts to Control Pest

X<sub>3</sub>= Developmental Stage

X<sub>4</sub>= Farm Size

X<sub>5</sub>= Bio-control

X<sub>6</sub>= Years of Experience

X<sub>7</sub>= Education Level

X<sub>8</sub>= Intercrop

X<sub>9</sub>= Reason for cultivating maize

X<sub>10</sub>= Secondary Occupation

*e<sub>i</sub>*= Standard error

age, sex, farm size and years of experience in maize production, they are hereby presented in Table 1. Result (Table1) shows that (9% ) of respondents were between ages 20-30 (27.8%) of respondents were between age 31-40 (26.3%) of respondents were between age 41-50,(20.3%) of respondents were between age of 51-60 while (16.5%) were above 60 years. Result (Table 1) shows that (88%) were male while the female respondents were (12%). The study (Table 1) shows that respondents having a farm size <3ha had the highest percentage (45.1%) while respondents with farm size 9-12ha had the lowest percentage (3.8%). Respondents with <20years of experience had highest percentage (32.3%) as compared to respondents between 11-15 years of experience which had the lowest percentage (12.8%).

## Results and Discussion

The study examined the socio-economic characteristics of the maize farmers in Yewa South Local Government. The selected characteristics are

**Table 1: Distribution of Socio-economic Characteristics of Respondents**

Variables	Frequency	Percentage
Age		
20-30	12	9.0
31-40	37	27.8
41-50	35	26.3
51-60	27	20.3
>60	22	16.5
Total	133	100
Sex		
Male	117	88
Female	16	12
Total	133	100
Farm size(ha)		
<3	60	45.1
3-6	32	24.1
6-9	9	6.8
9-12	5	3.8
>12	27	20.3
Total	133	100
Experience		
0-5	22	16.5
6-10	30	22.6
11-15	17	12.8

16-20	21	15.8
<20	43	32.3
Total	133	100

Field Survey 2020

**Table 2** shows that (84.2%) of the respondents intercropped maize with other crops while (15.8%) of the respondents intercropped maize with other crops across Yewa south local government Ogun state.

**Table 2: Distribution of intercrop of maize with other crops**

	Frequency	Percentage
Intercrop		
Yes	112	84.2
No	21	15.8
Total	133	100

The major challenges facing maize farmers across Yewa south local government Ogun state is revealed in Table 3. It shows that (39.8%) of the respondents major challenge is lack of equipment, (27.1%) of the respondents

are having challenge with other pest, (3%) of respondents has the challenge of capital and scarcity of labour while (2.3%) has the challenge of Fall Army worm.

**Table 3: Distribution According to Challenges facing Maize Farmers**

Challenge	Frequency	Percentage
Scarcity of labour	4	3.0
Capital	4	3.0
Fall army worm	3	2.3
Other pest	36	27.1
Rainfall	19	14.3
Equipment	53	39.8

Field Survey, (2020)

Table 4 shows the educational level of respondents, no formal education had the lowest percentage (9%), respondents with primary education (28.6%), respondents with secondary

education had the highest percentage (39.1%) while (23.3%) of the respondents had tertiary education.

**Table 4: Distribution of Level of Education**

	Frequency	Percentage
No formal education	12	9.0
Primary education	38	28.6
Secondary education	52	39.1

Tertiary education	31	23.3
Total	133	100

Field Survey 2020

**Table 5: Result of Regression Models**

Variables	Coefficients	Standard Error	P-Value
Constant	2282.460	4885.857	0.641
X <sub>1</sub>	-3545.356	3265.535	0.280
X <sub>2</sub>	2466.307	1357.497	0.072*
X <sub>3</sub>	2135.307	3466.387	0.539
X <sub>4</sub>	885.497	2167.634	0.684
X <sub>5</sub>	4266.057	745.233	0.000**
X <sub>6</sub>	104.978	2546.303	0.967
X <sub>7</sub>	992.071	731.304	0.177
X <sub>8</sub>	644.889	1436.275	0.654
X <sub>9</sub>	-2921.782	2892.989	0.315
R <sup>2</sup>	0.224		

\*Coefficient significant at 1% level

\*\* Coefficient significant at 5% level

The result in Table 5 shows the regression analysis. The coefficient of awareness of Fall Armyworm (X<sub>1</sub>) is negative which implies that the unawareness of many respondents about Fall Armyworm has contributed to the reduction in maize yield (dependent variable). The coefficient of attempts to control pest (X<sub>2</sub>) is significant at 1% level. The coefficient of bio-control is significant at 5% level. It shows that the method used to control the effect of the pest has not been effective which has contributed to decrease in the maize yield (dependent variable). The coefficient of determination with value of 0.224 shows that the explanatory variables explain that about 22.4% of the variations in the factors affecting Fall Armyworm leaving about 77.6% unexplained.

### Discussion

This study shows the socio-economic characteristics of maize farmers in Yewa south local government, majority of the respondents 88% of the farmers are males which is in accordance previous research which stated that majority of the maize farmers in Ogun state are males ( Idris Akanbi *et al.*2015). The research

also reveals that 85% of the farmers are married. It is an evidence that married men are into farming business to cater for the needs of their families. There is greater involvement of married people in farming activities in order to ensure household food security (Mbah *et al.*, 2016, Adegboye *et al.*, 2008). The larger number of the respondents had a farm size of less than three hectares which shows that majority of the respondents are into small scale farming. Studies show that more than 80 percent of the total farmers including medium and large ones are small scale farmers and the practice of small scale farming was rampant because of fragmented land holding (Akinsuyi, 2011, Mbah *et al.* 2016). The level of education of most maize farmers in Yewa south local government is secondary education level (39.1%) and about (23.3%) has tertiary education. The high percentage in the level of education of farmers shows the high level of exposure which is enabling factor in the acceptance of new innovation. It was observed that the more educated a farmer is, the more likely he adopts an innovation (Okojie, 2002).

A greater percentage of the respondents have a farming experience of 20 years and above (32.3%). This indicates that the respondents farming for a long period could be attributed to the fact that the study area is an agrarian community (Mbah et al. 2016). This study shows that majority of the respondents (84.2%) intercrop maize with other crops on their farm such as cassava, tomato, yam and others which shows that majority of the farmers in the south west adopted the intercropping system of planting on their farmland while 15.8% of the respondents plants solely maize. (Odeyemi et al. 2020, Idris Akanbi et al. 2015).

Larger percentage of respondents (39.9%) in Yewa south local government are affected by the lack of equipment. Basic modern farm tools that assist farmers to increase the yield thereby increasing the productivity of the farmer. Modern farm inputs are needed to raise small farm productivity (Mgbenka et al. 2015). The level of awareness of the farmers is negative, this is an indication that awareness plays a key role in tackling Fall Armyworm thereby reducing its effect on maize yield/productivity of the farmer. A farmer's lack of agricultural information is a factor that promotes ignorance of modern farm technologies in the farmer hence, the constraint requires more attention than it now gets (Mgbenka et al. 2015).

## Conclusion

The studies show that most farmers are not really aware of the pest fall armyworm (*Spodoptera frugiperda*), lack of equipment /chemicals has been a major challenge to some farmers in tackling the pest while illiteracy are the another reason why most farmers are not really aware about the pest called fall armyworm (*Spodoptera frugiperda*). It is therefore recommended that government thru various extension agents educate more farmers on the emergence of the new pest and

demonstrate ways to combat the pest to increase the production of maize.

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