



## Receptibility of Fall Armyworm (FAW) Information in Communication Media among Maize Farmers in Ogun State, Nigeria

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### ABSTRACT

This study examined the communication media used to receive Fall Armyworm (FAW) information by maize farmers in Ogun state. A multi-stage sampling procedure was used to select 77 respondents from six communities in three Local Government Areas of Ogun state. Data were collected using structured questionnaire and analyzed using Chi-square and Person Product Moment Correlation at  $p=0.05$  significance. About 34% of respondents were aged between 42-51 years, male (84.4%) and able to read and write in English language (63.6%). Majority of the respondents received information from farmers association ( $\bar{x} = 1.52$ ) among the available communication media. Majority had low frequency of use (76.6%) and unfavorable perception (70.1%) of modern media for FAW information. Significant relationship existed between respondents' ability to read or write ( $\chi^2=6.1$ ), marital status ( $\chi^2=6.8$ ) and the receptibility of FAW information through the communication media. The study concluded that maize farmers were not optimally utilizing modern communication media for FAW information due to unfavorable disposition. The study recommends the need to mainstream Education Entertainment into messages on FAW disseminated through the communication media to enhance its receptibility. Also, more emphasis on interpersonal media use will boost information spread on FAW among maize farmers.

**KEYWORDS:** Fall Armyworm, Communication media, Agricultural information, Receptibility, Maize.

### INTRODUCTION

Armyworm attack is among the major challenges facing farmers in East and Southern African countries. The African armyworm (*Spodoptera exempta*) is a pest of pastures and cereal crops in Africa south of the Sahara, parts of Arabia, Asia, Australia and the Pacific {1}. This migrant pest is capable of destroying entire fields of cereal crops and pastures in a few days, posing a major threat to food security. Indirect losses to livestock due to armyworm outbreaks in pastures can be severe, as a result of starvation or poisoning. There has been continuous attack on crops especially maize since the outbreak of the pest in 2016. Farmers have tried several attempts to mitigate this occurrence through the use of familiar and unrelated control means which has proved abortive.

Fall Armyworm (FAW) is known to be capable of causing severe damage by feeding on the foliage of suitable crops. The pest is a threat to national food security and livelihood of farmers. Communication media which is the major means of disseminating information to farmers has been used severally amongst farmers to create awareness on the pest. According to {2}, information about the pest and possible control measures were spread through print, radio and television media. Training were organized for Maize farmers in different farm settlements and Agricultural zones in Nigeria. For instance, radio and television stations, institutions and individuals have taken it upon themselves to disseminate the necessary information on FAW. Relevant organizations and agricultural bodies across Africa have also taken up the challenge of finding solutions to this endemic problem. Despite these efforts, confusion in the management and control of the pest still lingers {3}. This brings to question the effectiveness of the media or its accessibility among the maize farmers.

Information dissemination for agricultural development is aimed at transferring knowledge of research or new discoveries to farmers or consumer through available communication media. Agricultural information works in different ways; to cause knowledge change and adoption and to create awareness. Agricultural information can help to inform decision-making regarding land, labour, livestock, capital and management {2}. To achieve this, however, it is pertinent to use appropriate communication media that is most suitable for the information and the target audience.

Information regarding FAW is among the most sought for in the agricultural sector in Africa in recent years {4}. Farmers need up to date information on the life stages of the pest, the effective method of control and the type of crop it affects. Fall Armyworm is a dangerous pest that affect more than 60 types of crops and has spread its tentacles into many parts of Africa. It is very easy to spread because the dynamics of invasion and infestation is different from other types of pest. According to {5}, the pest has the ability to destroy more than 40,000 hectares in a single invasion

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thus, many farmers all across Africa are counting their losses every year since the outbreak of the pest in 2016. Likewise, {6} found that the devastation effect of FAW is helped by the high reproductive capacity it possess, such that a single female can lay 600 to 700 eggs and more especially under African conditions. Farmers have attempted several control methods which have proved ineffective because of the peculiarity of FAW, leaving farmers in a state of confusion and helplessness. Continuous infestation of this deadly pest on crops will leave farmers' field empty of food and the effect would be obvious on both the rich and the poor in the society.

One of the major crops that has suffered severe attack of FAW in Nigeria is Maize (*Zea Mays*). Fall Armyworm has caused reduction in maize production across Nigeria. It is a major pest of maize, although it affects vegetables such as Okro and pepper in some farmers' field. Maize farmers have given different perception to the pest across the country depending on the understanding of its attack and features. While some farmers in south western Nigeria believe that it could be an expression of the anger of God on the land, some thought it to be a strange occurrence that warns against the cultivation of maize in the land. Across the country, the severity of FAW varies between farms and communities.

Farmer's use of information dissemination on communication media depend on many factors {7} such as the relevance of such information, their perception to the media type used in disseminating the information, some basic personal characteristics, availability and frequency of use of the media. Although information that supports agricultural production and the processes involved are available, most of this information may not reach the farmers in their domain in the rural areas. Issues regarding language barrier, cost of acquiring information, poor infrastructure, limited communication tools and so on, have made the situation worse. It is against this background that the study investigates the use of communication media by farmers to access information on FAW in order to identify the gap that exist between information sources and farmers access to relevant information needed for agricultural production such as the case of FAW.

### Objective of the study

The main objective of this study is to assess the communication media used for disseminating FAW information among farmers in Ogun state. Specifically, the study aimed to:

- i. describe socio economic characteristics of the respondents in the study area,
- ii. determine the frequency of use of available communication media among the respondents in the study area,
- iii. identify types of information on armyworm disseminated through the available media; and
- iv. determine the perception of the respondents to communication media use for FAW information.

### Hypotheses of the study

**Ho1:** There is no significant relationship between the socio-economic characteristics of the respondents and frequency of use of communication media.

**Ho2:** There is no significant relationship between the perception of respondents to receiving information on armyworm their use of communication media.

## MATERIALS AND METHODS

**The study area** - The study was carried out in Ogun State, Nigeria. Ogun State is in the southwest rainforest zone of Nigeria. It lies within latitude 6°55' - 7°0'N and longitude 3°46' - 4°15'E, latitude of 26° and longitude 36° by Greenwich Meridian and is bounded in the West by the Republic of Benin, on the East by Ondo State, on the North by Oyo State and on the South by Lagos and the Atlantic Ocean. The average rainfall in the state ranges between 1250 mm and 1800 mm with a slight bimodal rainfall distribution which peak in June and October while the dry season stretches from mid-November to mid- March. Temperature ranges from 24°C to 32°C and average relative humidity of 80% to 90%. Ogun State covers about 16,409.26 square kilometers.

There are 20 Local Government Areas (LGA) in Ogun State which are Ifo, Ado-Odo/Ota, Ijebu North, Shagamu, Abeokuta South, Obafemi Owode, Abeokuta North, Egbado North, Egbado South, Ijebu Ode, Ipokia, Odogbolu, Ikenne, Odeda, Ijebu East, Imeko Afon, Ogun Waterside, Ijebu North East, Remo North, and Ewekoro. Ogun State is divided into four (4) ADP zones which are further divided into blocks and cells by the Ogun State Agricultural Development Project (OGADEP) .The 4 zones are Abeokuta, Ikenne, Ilaro and Ijebu Ode. The blocks are further divided into cells while the cells consist of many farming communities.

**Sampling technique and sample size** - Ogun state was purposively selected because the state is one of the states that has recorded high level of maize field infestation by FAW in southwest Nigeria {5} and the pest was first discovered in the state. A multi-stage sampling technique was employed in the selection of respondents for this study. In the first

stage, 10% (3) of the 20 LGA in the state was selected randomly to give Yewa North, Ado-odo ota and Sagamu. The second stage involved the random selection of one village/community from each of the selected local government areas. This stage led to the selection of Sagamu in Sagaamu LGA, Ibese in Ado-odo ota LGA and Babawo in Yewa North local Government. In the third stage, 50% of maize farmers was sampled giving a total of seventy seven respondents for the study.

**Measurement of variables** - Primary data with the use of structured questionnaire was used in the study to collect data on the socio-economics characteristics of respondents, extent of use of communication media to access FAW information, type of FAW information received on communication media and perception of farmers on use of communication media to disseminate FAW information. Frequency of use of communication media to assess FAW information was measured on a scale of daily, weekly, monthly and yearly with a score of 4, 3, 2 and 1 respectively.

**Data analysis** - Data was described using means, percentages and frequencies while Chi-square, Pearson Product Moment Correlation (PPMC) inferential tools were used to test the hypotheses.

## RESULTS

### Socio-economic characteristics of respondents

Table 1 shows that the mean age of respondents was 49 years. Only 14.3% had no formal education and majority (63.6%) could read and write English. Majority (92.2%) were married with an average of 6 persons in their households. This result suggest that the respondents were relatively young and could access information through any communication medium available. It also reiterates the fact that at the age, farmers should be more inquisitive about finding solutions to FAW than their aged counterparts. This is consistent with the report of {8} that young farmers have the ability to access information in modern communication media faster and they stand a better stead to attaining higher agricultural productivity than older farmers. Furthermore, the table shows that majority were educated and could read and write in English language. This implies that maize farmers in the area had sufficient level of literary ability to afford them access to information disseminated through any medium. Education is an important socio-economic factor that influences farmers' adoption of improved technology {9}.

**Table 1 Distribution of respondents according to socio economics characteristics**

Variable	Frequency	Percentage	Mean ± SD
<b>Age</b>			
22 – 31	10	13.0	
32 – 41	15	19.5	
42 – 51	26	33.8	49 ± 13 years
52 – 61	17	22.1	
62 and above	9	11.7	
<b>Sex</b>			
Male	65	84.4	
Female	12	15.6	
<b>Marital Status</b>			
Single	5	6.5	
Married	71	92.2	
Widowed	1	1.3	
<b>Education Status</b>			
No formal Education	11	14.3	
Adult education	6	28.6	
Primary education	22	28.6	
Secondary Education	23	29.9	
University Education	14	18.2	
Post University	1	1.3	
<b>Ability to read and write English</b>			
Yes	49	63.6	
No	28	36.4	
<b>Years in school</b>			5.4±4.0 years
<b>Household size</b>			6±2 people

Source: Field study, 2019

### Frequency of receiving information from available communication media

Table 2 shows the distribution of respondents by the frequency at which they received armyworm information on communication media. The table shows that farmers' association ranked highest ( $\bar{x}=1.52$ ) in the medium used to

receive information on FAW. This was closely followed by lectures/ workshop ( $\bar{x}=1.36$ ) and television ( $\bar{x}=1.32$ ). The least media utilized were internet ( $\bar{x}=0.27$ ) and pamphlets ( $\bar{x}= 0.44$ ). Information on FAW has been disseminated using different platforms in the recent past, however, farmer's use of communication media depends on different factors {10} which include easy access and type of information needed {11}. In line with this, information disseminated through medium such as maize farmers association might be easily accessible and regarded to be more reliable by members than other medium in the case of FAW. The opportunity of membership of farmers association could have afforded respondents the privilege of attending workshops organized to create awareness by concerned organizations. On the other hand, inability of respondents to access FAW information from internet and print media laments the low rate of media literacy present in the area. According to {12}, no matter how beautiful an agricultural information is, it remains irrelevant to farmers if such cannot be easily accessed. Thus, the foregoing suggests that agricultural information on the internet and print media are not useful for local farmers because of low access.

Categorization of respondents according to frequency of receiving information on FAW from different communication media shows that majority (76.6%) had low frequency of access to information on FAW disseminated through the media. This result implies the low awareness of fall armyworm despite the high rate of spread of the pest among maize farmers. This also suggest that communication media are not effectively utilized for fall armyworm intervention by concerned organizations. In a study by {13}, the first step to consider in farmers use of information is their capacity to access the appropriate communication media. In line with this position, most maize farmers might not have the capacity to access the particular media through which such information is disseminated.

**Table 2: Frequency at which respondents received armyworm information on communication media**

Medium/mass media	Daily	Weekly	monthly	Yearly	Never	Mean
Radio	1(1.3)	1(1.3)	9(11.7)	53(68.8)	13(16.9)	1.17
Television	0(0.0)	0(0.0)	17(22.1)	31(40.3)	29(37.7)	1.30
Internet	0(0.0)	2(2.6)	2(2.6)	11(14.3)	62(80.5)	0.27
Newspaper	2(2.6)	5(6.5)	13(16.90)	4(5.20)	53(68.8)	0.68
Pamphlets	3(3.9)	6(7.8)	3(3.9)	0(0.0)	65(84.4)	0.44
Interpersonal media						
Fellow farmer	1(1.3)	5(6.5)	9(11.7)	33(42.9)	29(37.7)	1.19
Farmer association	4(5.2)	26(33.8)	10(13.0)	3(3.9)	34(44.2)	1.52
Extension agent visit (teaching)	15(19.5)	10(13.0)	0(0.0)	4(5.2)	48(62.3)	1.22
Lecture/workshop	22(28.6)	4(5.2)	0 (0.0)	5(6.5)	46(59.7)	1.36

Source: Field study, 2019

Note: Figures written in parentheses are in percentage

**Table 2(b): Respondents level of receipt of information on FAW through communication media**

Perception category	Score	F	Percentage (%)
High receivers of information	3.45 – 22.0	18	23.4
Low receivers of Information	0.00 – 3.44	59	76.6

### Types of Fall Armyworm information received by maize farmers and regularity

Table 3 presents the types of information the respondents have access to on regular basis. The table shows that farmers received information on the spread ( $\bar{x}=0.58$ ), biological control ( $\bar{x}= 0.58$ ) and chemical control ( $\bar{x}= 0.58$ ) of FAW more than other information available. According to {12}, farmers always look for information that is relevant to solve the immediate problem on the farm using available communication media. In line with this, farmer's interest in the FAW spread might be to ascertain possible global or national response to the pest invasion. Information on control of FAW will guide farmers into the type of control most suitable for their farms.

**Table 3: Distribution of respondents based on frequency at which they received specific information on FAW**

S/N	Information on armyworm	Frequency of use				Mean
		Daily	Weekly	Monthly	Yearly	
1	Armyworm infestation	2(2.6)	6(7.8)	6(7.8)	0(0.0)	0.44
2	Armyworm spread	3(3.9)	6(7.8)	1(1.3)	2(2.6)	0.58
3	Chemical control method	6(7.8)	7(9.1)	0(0.0)	0(0.0)	0.58
4	Biological control measures	0(0.0)	14(18.2)	1(1.3)	1(1.3)	0.58
5	Agronomic /cultural control	0(0.0)	15(19.5)	0(0.0)	(1.3)	0.48
6	Where to purchase chemical	0(0.0)	11(14.3)	2(2.6)	0(0.0)	0.27
7	Identification of fake chemical	0(0.0)	7(9.1)	0(0.0)	0(0.0)	0.49

**Perception of respondents to communication media use for Fall Armyworm information**

Table 4 shows the distribution of the respondents to perception statements on the use of communication media for FAW information dissemination. The table reveals that the highest level of agreement were indicated for statements that communication media use for dissemination makes information on FAW conflicting to farmers ( $\bar{x}$ =3.65) and that the modern media use is not as appropriate as other alternatives to empower farmers to control infestation of FAW ( $\bar{x}$ =3.57). Least extent of agreement was indicated for statement that modern media use is the best for creating awareness on armyworm ( $\bar{x}$ =2.30). It can be inferred from these results, that farmers quest for and use of agricultural information on available communication media is limited to some areas of need. The experience of shock and mental devastation due to loss of acres of maize farm as a result of fall armyworm attack could be too personal for a supposedly general information disseminated in modern communication media. On the other hand, messages disseminated/spread through informal means might not appear too genuine to be effective for a high infestation pest such as the fall armyworm

Categorization of respondents based on perception to communication media use for fall armyworm dissemination in Table 4(b) shows that majority (70.1%) had unfavourable perception to the use of modern media to disseminate information on fall armyworm. The result suggests that maize farmers are not fully keyed into the opportunity in communication media to creating awareness and increasing knowledge on agricultural information. This disposition might be connected to the position of {14} that agricultural information disseminated through modern media are urban based and only useful as entertainer for rural dwellers.

**Table 4 (a): Distribution of respondents according to perception of communication media use for disseminating armyworm information**

Statements	SA	A	U	D	SD	Mean
The message on armyworm is clearer on media	2(2.6)	8(10.4)	47(61.0)	15(19.5)	5(6.5)	2.83
Communication media use makes information on armyworm conflicting to farmers.	14(18.2)	22(28.6)	41(62.3)	0.0	0(0.0)	<b>3.65</b>
Communication media makes the armyworm infestation real/convincing	1(1.3)	10(13.0)	48(62.3)	11(14.3)	7(9.1)	2.83
Media information on fall armyworm improves understanding of the pest	3(3.9)	17(22.1)	47(61.0)	6(7.8)	4(5.2)	3.12
Most information disseminated on armyworm in media are fake	5(6.5)	20(26.0)	52(67.5)	0(0.0)	0(0.0)	3.39
The modern media use is not as appropriate as other alternatives to empower for control of armyworm	16(20.8)	12(15.6)	49(63.6)	0(0.0)	0(0.0)	3.57
Media use is the best for creating awareness on armyworm	8(10.4)	10(13.0)	41(53.2)	7(9.1)	11(14.3)	2.30
Accessing media information on armyworm is too expensive	7(9.1)	20(26.0)	50(64.9)	0(0.0)	0(0.0)	3.44
Communication media can only create awareness but cannot help in the control	13(16.9)	16(20.8)	37(48.1)	6(7.8)	5(6.5)	2.66
Media use for armyworm is good because most media tools are accessible	5(6.5)	17(22.1)	46(59.7)	4(5.2)	5(6.5)	3.17
Armyworm infestation is too severe to accept/believe information on control from the media	12(15.6)	18(23.4)	47(61.0)	0(0.0)	0(0.0)	3.55
There is no opportunity for feedback on information received from media on armyworm	13(16.9)	15(19.5)	43(55.8)	4(5.2)	2(2.6)	2.57
Information on armyworm in the media is detailed and self-explanatory	1(1.3)	14(18.2)	50(64.9)	7(9.1)	5(6.5)	3.00
The media equips with information on control measures on fall armyworm.	1(1.3)	12(15.6)	53(68.8)	6(7.8)	5(6.5)	3.00

**Table 4(b) Perception category of respondents to use of communication media for FAW information**

Perception category	Score	F	Percentage (%)
Favorable	44-64.0	23	29.9
Unfavorable	37.0 – 43.9	54	70.1

**Relationship between respondent’s socio-economic characteristics and receipt of fall armyworm information from available communication media**

The result on Table 5 shows the relationship between the selected socio-economic characteristics and frequency of receipt of FAW information from communication media. All the selected socio-economic characteristics of the respondents such as age, year of schooling, farm size, and household size were not significantly related to the frequency of receipt of FAW information from communication media. This suggests that all the selected socio-economic characteristics of the respondents did not have direct influence on their use of communication media to

receive fall armyworm information. Furthermore, a significant relationship existed between the respondents' ability to read or write ( $\chi^2=6.1$ ), marital status ( $\chi^2=6.8$ ) and the frequency of receipt of FAW information on communication media. Thus, ability to read and write could be termed as a major factor in farmers search for information. According to {15}, ability to read or write the native language will provide opportunity of access to the same information through different media. The results further reveal that there is no significant relationship between the respondent's sex and frequency of usage of communication media on army worm.

**Table 5: Relationship between socio economic characteristics and communication media available and the frequency of usage of communication media on army worm**

Variable	r	p-value
Age	0.023	0.840
Year in school	0.214	0.067
Farm size	0.176	0.132
Household size	0.203	0.08
Perception	0.19	0.83

  

Variable	$\chi^2$	p-value
Ability to read or write	6.1	0.001*
Marital status	6.8	0.034*
Sex	0.1	0.074

\*significant @5%

### Conclusion and recommendations

Based on the findings of this study, receptibility of fall armyworm information disseminated through the different communication media was low among the maize farmers. This was attributed to the poor ability of most maize farmers to read and write in the native language through which information was packaged and disseminated. There was significant relationship between respondents' ability to read or write, marital status and the frequency of receipt of information on armyworm through the communication media. It is therefore recommended that development organisations need to mainstream Entertainment Education (EE) into the army worm messages disseminated through the mass media to enhance its acceptability and more efforts should be concentrated on disseminating FAW through interpersonal media which shows to be more acceptable to the farmers.

### REFERENCES

1. Faithpraise F.O, Idung J., Chatwin C., Young R and Birch P. 2015. Modelling the control of African Armyworm (*Spodoptera exempta*) infestations in cereal crops by deploying naturally beneficial insects. *Biosystems Engineering Journal*. 129: 268 – 276.
2. Toepfer S., Kuhlmann U., Kansiiime M., Onyango D.O., Davis T., Cameron K and Day Roger. 2019. Communication, Information sharing, and advisory services to raise awareness for fall armyworm detection and area- wide management by farmers. *Journal of Plant Disease and Protection* 126: 103 106.
3. Farm Radio International. 2017. Voices of Farmers facing the Fall armyworm – how radio is helping farmers. Retrieved online from farmradio.org
4. Assefa F and Ayalew D 2019. Status and control measures of fall armyworm (*Spodoptera frugiperda*) infestations in maize fields in Ethiopia: A review *Congent food and Agriculture* 5 (1): 1 – 16.
5. Goergen G., Kumar P.L Sankun S.B, Togola A. and Tamo M. 2015. First Report of Outbreaks of the Fall Armyworm (*spodoptera Frugiperda* (J.E Smith) (Lepidoptera, Noctuidae), a new Allien Invasive Pest in West and Central Africa. *PLoS ONE Journal* 11 (10): 1 – 9.
6. Sandomla A and Kukret I 2019. Fall Armyworm Attack: the damage done. The deadly but little understood crop pest, poses a threat to food security and livelihoods of millions as it ravages crops in Africa and now Asia. Down to earth – Online published on 18th March, 2019. Retrieved on the 12 Sep 2019.
7. Aldosari F. and Noor M. A 2019. Farmers' perceptions regarding the use of Information and Communication Technology (ICT) in Khyber Pakhtunkhwa, Northern Pakistan. *Journal of the Saudi Society of Agricultural Sciences* 18 (2): 211 – 217.

8. Okoedo-Okojie D.U and Omoregbee F.E 2012: Determinants of Access and Farmers use of Information and Communication Technologies (ICTs) in Edo State Nigeria. *Journal of Applied Science and Environmental Management* 16 (1): 41 – 44.
9. Anyam F.Y and Frempong G. 2018. An investigation into Barriers that Hinder the Effective Use of ICT in farming by small Scale Farmers in Asuogyaman District, Ghana. *International Journal of Humanities Social Sciences and Education (IJHSSE)* 5 (1): 23 – 32.
10. Khan S., Rahman M.H and Uddin M.N 2017. Effectiveness of selected mass media in agricultural technology transfer to the farmers of Bangladesh. *Research in Agriculture, Livestock and Fisheries Journal* 4 (1): 7 – 13.
11. Agwu A.E and Mbah E.N 2012. Information Communication Technology needs of Small-scale farmers in Anambra State, Nigeria. *Journal of Agricultural and Food Information* 13 (2): 144 – 156.
12. Parmar I. S., Soni P., Kuwornu J.K.M. and Salin K.R 2019. Evaluating Farmers access to Agricultural Information: Evidence from Semi-Arid Region of Rajasthan State, India. *Agriculture journal MDPI* 9 (60): 1 – 17.
13. Opara, S. 2014. Micronutrient deficiency, huge challenge for Nigeria government. *The Punch Newspaper* of May 31, 2014. Retrieved from [www.punchng.com/business](http://www.punchng.com/business) August 24,2014
14. Edet I P and Joseph A.L 2017. Media Mix as Determinants of Utilization of Development Information in Rural Communities of South-South, Nigeria. *Journal of Research and Methods in Education* 7(3): 8 – 14.
15. Obidike N.A 2011. Rural Farmers ‘problems accessing Agricultural Information: A case study of Nsukka Local Government Area of Enugu State, Nigeria. *Library Philosophy and Practice (e-journal)* 11: 660. Retrieved from <http://digitacommons.unl.edu/libphilpract/660>.