

PERCEPTION OF FARMERS ON THE USE OF PESTICIDES AND FERTILIZERS ON LOCALLY GROWN CROPS IN AKPABUYO LOCAL GOVERNMENT AREA OF CROSS RIVER STATE, NIGERIA

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ABSTRACT

The study assessed farmers' perception of the use of pesticides and fertilizers on locally grown crops in Akpabuyo Local Government Area of Cross River State, Nigeria. Specifically, the study described the socio-economic characteristics of the respondents in the study area, identified sources and types of pesticides and fertilizers used on locally grown crops, assessed farmers' perception of the use of pesticides and fertilizers for the production of locally grown crops and ascertained factors affecting the use of pesticides and fertilizers in the production of locally grown crops. A sample size of 90 respondents were selected through multistage sampling procedure from crop farmers in Akpabuyo Local Government Area. Descriptive statistics such as frequency, percentage, mean scores and rank were used for data analysis. Result of the socio-economic characteristics of the respondents revealed that majority were aged between (45-54) years (27.78%). The result, also showed that NPK, compost manure and poultry droppings ranked (1st, \bar{X} = 4.11), (2nd, \bar{X} = 3.88) and (3rd, \bar{X} = 3.84) respectively as the major fertilizers available for locally grown crops. The results of the perception of farmers on the use of pesticides and fertilizers revealed that agro-chemicals were beneficial for increased yield (1st, \bar{X} = 386) and expensive (2nd, \bar{X} = 3.76). The result on factors affecting the use of pesticides and fertilizers revealed that environmental pollution was the major adverse effect of agro-chemicals (1st, \bar{X} = 4.52) followed by killing of non-target organisms (2nd, \bar{X} = 3.95). The study concluded that major pesticides used by respondents were herbicides, insecticides/bactericides and that over application causes water pollution and kill non-target organisms.

Key words: Perception, farmers, pesticides, fertilizers, locally grown crops and Akpabuyo.

INTRODUCTION

Agro-chemicals (pesticides and fertilizers) are chemical substances used in agriculture to manage, destroy, attack, repel and control pests, diseases, pathogens, parasites and weeds for improved agricultural production and food security thereby eliminating hidden hunger menace, malnutrition and malnourishment. (Carolyn, 2013; Jeony and Forster, 2003; Effiong and Effiong, 2015).

Pesticides are substances used in controlling pests and weeds in the farm. Some of these pesticides are; herbicide, insecticide, nematocidal, termiticide, avicide, molluscicide, rodenticide, bactericide, insect repellent, animal repellent, fungicide, sanitizer, disinfectant and growth regulators (Adetunji, 2010; Effiong and Asikong, 2013). Pest and disease infestations are common occurrences in agricultural production leading to crop losses and low yield/productivity; however, this can be reduced by crop protection measures through the use of synthetic pesticides which has become the most familiar way to minimize potential crop loss.

According to FAO, 2015, a fertilizer is a natural or synthetic substance used to enhance plant growth, fertility and development. Fertilizers may also enhance water retention and filter any excess liquid, thereby enhancing soil effectiveness. Fertilizers typically offer three major macronutrients in the soil, namely; Potassium, Nitrogen and Phosphorus. It may also be a major source of secondary nutrients in the soil such as; Sulphur, Magnesium and Calcium.

Traditionally, use of agrochemicals for the production of arable crops such as cassava, maize, yam, rice and beans among others are not popular. However, many crop production technologies introduced by extension to farmers have in recent times promoted the use of agrochemicals among farmers though the rural poor still have some reservations on such chemicals. Also, diverse perception of fertilizers and pesticides use in farm innovations could affect the acceptance of such innovations in Akpabuyo in particular and Nigeria in general. There is also a growing concern among local crop farmers in Akpabuyo Local Government Area of Cross River State that, certain agrochemicals used in local crop production are very costly, unaffordable, unavailable and difficult to handle (Effiong and Effiong, 2015).

RESEARCH METHODOLOGY

The study was conducted in Akpabuyo Local Government Area of Calabar agro-ecological zone of Cross River State with headquarters at Ikot Nakanda. Akpabuyo is an agrarian area measuring approximately 28.5km² with an estimated population of 360,000 people (NPC, 2006) and is popularly referred to as "Food Basket" of Cross River State. Akpabuyo has 10 council wards the major languages spoken are Efik and

English while major ethnic groups are the Efiks, the Quas and Efuts, they share common cultural and ancestral heritage. Akpabuyo is a major producer of cassava, cocoyam, kolanut, coconut, palm among many others. (Effiong and Asikong, 2013). The land is rich in mineral deposits, and in commercial quantities. A multistage sampling technique was used to select the respondents. At first stage, purposive sampling technique was used to select Akpabuyo as a block. This was because, Akpabuyo is predominantly an agrarian society. The second stage was a random selection of six cells from the block. In the third stage, 15 respondents were randomly selected from each of the selected cells. This produced a sample size of 90 respondents. Data collection was done with the aid of an interview schedule during the 2017 cropping season. Data were presented using percentage, frequency, ranking and means scores.

RESULTS AND DISCUSSION

Table 1 showed the distribution of respondents according to their socio-economic characteristics. Most (27.78%) of the respondents were aged between 45 - 54 years. This implies that most of the farmers in the study area were middle aged people who are still strong and energetic. Young people are most likely to utilize agrochemicals such as fertilizers and pesticides on their crops. Also, results in Table 1, showed that majority of the respondents (66.67%) were males, while (33.33%) were females. (44.44%) had tertiary education, (77.78%) were engaged in mixed farming as major type of occupation, (38.89%) had farming experience of 31-40 years, (54.44%) cultivated 1-2 hectares of farmland, (61.11%) accessed land by inheritance while (33.33%) earned between N51,000-N80,000 per annum. This result corroborates the findings of Effiong and Effiong (2015) who reported that majority of the farmers are engaged in mixed farming as a major type of occupation in Akwalbom State, Nigeria.

Table 2 showed the distribution of respondents based on their sources and types of pesticides and fertilizers used for locally grown crops. The results in Table 2 revealed that herbicides, insecticides and bactericides were ranked (1st, \bar{X} = 3.90), (2nd, \bar{X} = 3.85) and (3rd, \bar{X} = 3.70) respectively as the major type of pesticide available for locally grown crops in the study area, while NKP, compost

manure and poultry droppings ranked (1st, \bar{X} = 4.11), (2nd, \bar{X} = 3.88) and (3rd, \bar{X} = 3.84) respectively as the major source of fertilizers available for locally grown crops. This result corroborates with the findings of Carolyn, 2013; Jeony and Forster, 2003; William and Wise, 2006; Effiong and Effiong, 2015); Effiong, Ijioma, Effiong, (2016) who asserted that application of pesticides and fertilizers increases agricultural productivity and food security hence minimizing hidden hunger among farmers in the study area. This is so because pesticides and fertilizers are major inputs in agricultural business enterprise. The result also showed that farmers' sources and types of agrochemicals were numerous and diverse. This implies that extension services must address the fertilizers and pesticides need of farmers holistically.

On the perception of farmers towards the use of pesticides and fertilizers for locally grown crops as shown in table 3, the result revealed that agrochemicals are beneficial for increased crop yield/ (\bar{X} = 3.86) but are extremely expensive (\bar{X} = 3.76); it also showed that excessive application of pesticides and fertilizers causes water pollution (\bar{X} = 4.25) Also, the results revealed that small proportion of farmers were of the opinion that the use of pesticides and fertilizers will lead to reduction in crop yield 7th (\bar{X} = 1.00). Air pollution 6th (\bar{X} = 1.52) and harm to other farmers 5th (\bar{X} = 2.61). Furthermore, the results revealed that most farmers used recommended quantity of pesticides and fertilizers (1st, \bar{X} = 4.06) used more than recommended quantity (2nd, \bar{X} = 2.76) and used less than recommended quantity (3rd, \bar{X} = 2.50). This result corroborates with the findings of (Effiong and Asikong, 2013) who reported that crop yield and farm productivity will be increased when farmers use recommended quantity and quality of pesticides and fertilizers on crops.

Factors affecting use of pesticides and fertilizers in the production of locally grown crops is shown in Table 4, the Table revealed that environmental pollution, killing of non-target organisms and reduction of crop yield due to over-accumulation/application ranked (1st, \bar{X} = 4.52), (2nd, \bar{X} = 3.95) and (3rd, \bar{X} = 2.51) respectively in the study area. This implies that the respondents were facing serious constraints in the use of fertilizers and pesticides in their farm operations.

Table 1: Distribution of respondents according to their Socio-economic characteristics

Variables	Frequency	Percentage
Gender		
Male	60	66.67
Female	30	33.33
Age (Years)		
15-24	10	11.11
25-34	15	16.67
35-44	20	22.22
45-54	25	27.78
≥55	20	22.22
Level of education		
No formal education	4	4.44
Primary	11	12.22
Secondary	35	38.89
Tertiary	40	44.44
Types of occupation		
Mixed farming	70	77.78
Trading	15	16.67
Civil servant	5	5.56
Farming experience		
2-10	4	4.44
11-20	6	6.67
21-30	25	27.78
31-40	35	38.89
40 and above	20	22.22
Farm size (in hectares)		
1-2	49	54.44
4-5	19	21.11
6-8	15	16.67
10 and above	7	7.78
Household size		
2-4	25	27.78
4-5	40	44.44
6-8	20	22.22
10 and above	5	5.56
Income level		
20,000-40,000	24	26.67
41,000-50,000	25	27.78
51,000-80,000	30	33.33
81,000-100,000	11	12.22
System of Land ownership		
Purchase	55	61.11
Inheritance	15	16.67
Leasehold	5	5.56
Free gift/communal		

Source: Field survey, 2017.

Table 2: Sources and types of pesticides and fertilizers for locally grown crops

Sources of pesticide and fertilizer for locally grown crops	A (4)	O (3)	S (2)	N (1)	Mean (\bar{x})	SD	Rank
Organic sources	60.0	23.5	10.6	5.9	3.95	0.38	2 nd
Inorganic sources	63.0	20.0	9.4	7.6	4.05	0.35	1 st
Types of pesticides available for locally grown crops							
Herbicides	40.0	35.2	22.4	2.4	3.90	0.41	1 st
Fungicides	28.2	33.0	25.8	13.0	3.35	0.71	4 th
Nematicides	63.6	63.5	8.2	4.7	2.10	0.75	5 th
Insecticides	17.0	20.5	34.1	28.4	3.85	0.62	2 nd
Rodenticides	16.5	22.1	27.3	34.1	3.70	0.5	3 rd
Bactericides	8.2	10.6	64.7	16.5	1.67	0.48	7 th
Botanicals (plants extracts pesticides)	7.1	12.9	44.7	35.3	1.79	0.31	6 th
Source of fertilizers available for locally grown crops							
Poultry dropping	49.4	23.5	17.6	9.5	3.84	0.55	3 rd
Compost manure	53.0	27.1	17.7	2.2	3.88	0.52	2 nd
Green manure	57.7	20.0	18.8	3.5	2.50	0.69	4 th
NPK fertilizer	51.8	18.7	16.5	13.0	4.11	0.35	1 st

Keywords: Always, O = Occasionally, S = Sometimes, N = never, \bar{X} = mean, SD = standard deviation
(Source: Field survey, 2017)

Table 3: Perception of farmers on the use of pesticides and fertilizers for locally grown crops

Farmers perception	SA (4)	A (3)	D (2)	SD (1)	Mean (\bar{x})	SD	Rank
Agrochemicals are more beneficial	22.9	28.2	30.6	8.3	3.86	0.49	1 st
Agrochemical are extremely expensive	16.5	16.5	36.6	30.4	3.76	0.55	2 nd
Agrochemical are very expensive	20.1	18.7	27.1	34.1	3.58	0.46	3 rd
Agrochemical are very cheap	6.2	11.6	65.7	16.5	3.20	0.72	4 th
Farmers opinion about the effects of pesticides							
Water pollution	59.5	24	10.5	6.0	4.25	0.45	1 st
Harmful to farm labour (human)	22.5	18.6	32.7	26.2	3.89	0.39	2 nd
Air pollution	6.7	12.1	60.5	20.7	1.52	0.37	6 th
Harmful to other persons	56.8	20.7	19.0	3.5	2.61	0.65	5 th
Crop pollution	22.5	18.4	25.1	34.0	3.50	0.29	3 rd
Harmful to animals	28.9	34	24.1	13.0	3.25	0.42	4 th
Reduction of crop yield	6.5	11.4	62.0	20.1	1.00	0.95	7 th

Quality of pesticides and fertilizers used

Used recommended quantity	42.3	22.1	33.0	2.3	4.06	0.52	1 st
Used more than recommended quantity	50.8	27.6	18.0	3.6	2.76	0.42	2 nd
Used less than recommended quantity	36.2	30.6	20.5	12.7	2.50	0.38	3 rd

Keywords: SA = strongly agree, A = agree, D= disagree, SD= strongly disagree, SD= standard deviation
(Source: Field survey, 2017)

Table 4: Factors affecting the use of pesticides and fertilizers in the production of locally grown crops

variables	SA (4)	A (3)	D (2)	SD (1)	Mean ($\bar{}$)	SD	Rank
Adverse effect of agrochemicals							
Environmental pollution	29.4	34.1	30.6	5.9	4.52	0.41	1 st
Killing of non-target species	53.0	27.0	17.6	2.4	3.95	0.58	2 nd
Reduction of crop yield	63.6	23.5	11.7	1.2	2.51	0.49	3 rd
Leftover of agrochemical solutions							
Stored and used for another application	60	23.5	10.6	5.9	4.25	0.56	1 st
Pour into bushes/river/stream	18.0	22.80	26.1	33.0	3.05	0.39	2 nd
Sales to other farmers	60.8	26.3	10.2	2.7	2.50	0.72	3 rd
Apply even though it is not needed	45.9	32.3	18.3	3.5	4.05	0.45	4 th
Disposed on the soil	10.0	10.8	64.7	14.5	1.75	0.75	5 th
Disposal of empty agrochemical containers							
Use them for household purpose	32.9	36.5	24.7	5.9	2.1	0.71	4 th
Buried in the soil	4.8	15.3	56.5	23.4	4.0	0.38	2 nd
Left in the nearby farm	40.5	35.3	23.0	1.2	4.11	0.42	1 st
Burnt	50.0	23.9	17.1	9.00	3.9	0.55	3 rd

Keywords: SA = strongly agree, A = agree, D= disagree, SD= strongly disagree, SD= standard deviation
(Source: Field survey, 2017).

CONCLUSION

The study concluded that majority of the respondents (66.67%) were males with farming experience ranging from 31-40 years (38.89%) ,cultivated 1-2 hectares of farmland (54.44%).The study also concluded that NPK fertilizer, compost

manure and poultry dropping were the major source of fertility available for locally grown crops,also herbicides, insecticides and bactericides were major pesticides available for crops in the study area.

RECOMMENDATIONS

Based on the findings of the study, the following policy recommendations were preferred.

- Human capacity development should be encouraged, by training farmers on the efficient and safe use of agro-chemicals through improved extension service systems.
- Fertilizers and pesticides should be subsidized, affordable and available to the farmers.
- Containers of agro-chemicals should be properly disposed and managed to reduce environmental pollution.
- That a greater assent should be given to agricultural extension services through proper funding and provision of logistics support such as fertilizers, pesticides, new crops varieties and credit facilities for dissemination to farmers in the study area.

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