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Effect of the Use of Agrochemicals Among Arable Farmers In Oyo State, Nigeria

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Abstract

The Study investigated the socio-economic characteristics of the farmers, various types of agrochemicals used, sources of the agrochemicals, effects of using the Agrochemicals and the constraint to the use of Agrochemicals in Oyo State. A four-stage sampling procedure was used to select one hundred and twenty respondents for the study. Descriptive statistical tools such as precision counts, frequencies and percentages were used in analysing the data; chi-square was used to test the hypothesis. Findings of the study revealed that fertilizer (60.83%) is the commonly used agrochemicals in the study area. About (65.83%) of the respondents source their agrochemicals from agrochemical stores. Also, majority (65%) of the farmers experience crop injuries as the major effect of using agrochemicals while others claimed to have suffered environmental pollution (13.33%), skin irritation (12.5%) and soil degradation (9.17%) as the effect of using agrochemicals. 44.20% of the farmers were faced with the constraint of inadequate access to capital and 20.83% faced technical knowhow as constraints. The study also showed that there is no significant relationship between the farmer's age ($X^2 = 14.092$, $p > 0.05$), Gender ($X^2 = 1.003$, $p > 0.05$), Marital status ($X^2 = 8.710$, $p > 0.05$), Farming experience ($X^2 = 11.502$, $p > 0.05$) and Size of Farm land ($X^2 = 14.266$, $p > 0.05$) and effect of agrochemicals usage. However, there was a significant relationship between the farmers level of education ($X^2 = 31.43$, $p < 0.05$) and the effect of using the agrochemicals. Based on the findings of the study, it was recommended that farmers should form cooperative in order to pool resources together to solve their problem. Government should make agricultural input available and affordable to the farmers through subsidy. Training on agrochemicals usage should be enforced on all Farmers so as to curb the hazardous effects of the chemicals.

Key words: Agrochemicals, Arable Farmers, Agricultural input, Crop injuries.

Introduction

Agriculture is described as the processes involved in controlled production of plant and animal materials which are used by man. Agriculture as a domestication of plants and animals, appeared only about 10,000 years ago, started from peasant farming that generates little or no hazardous waste. But with the mounting demands of growing populations, agriculture has been undergoing accelerated change over the last century to sophisticated mechanized farming system, which has resulted to uncontrollable waste to the environment causing a lot of pollution to air, water and soil (Rocket, 2007).

In addition, it has allowed more plants and animal production per unit area of land; all this was achieved with the application of required amount of chemicals such as

fertilizer, herbicides and pesticides which have harmful effects on the environment (Ecobichon, 1995).

Agrochemicals refer to substances used to help manage an agricultural ecosystem, or the community of organisms in a farming area. Agrochemicals are important agricultural inputs to protect crops from diseases, pests and weeds. The uses of agrochemicals contribute not only to healthy growth of crops and animals but also to improve farm work efficiency and stable supply of tasty agricultural produce. Although many kinds of chemicals are used in agriculture, they can be categorized into simple groups according to the functions they performed. This includes insecticides, herbicides, fungicides, molluscides, and rodenticides, just to mention but a few (Peter, 2012).

The application of Agrochemicals for the control of wide variety of insectivorous, herbaceous pests and green leaves since chemical age, has contributed enormously to the success of agricultural advancement globally, but with some noticeable pollution effects on ecosystem and human health (Beseler *et al.*, 2008). Most farmers in developing world are not aware of the environmental impacts of using agrochemicals on their farms, human being and wildlife (Kamel, 2004.)

Based on the aforementioned problem stated above, this study made an attempt to address the following research questions. What are the Socio-economic characteristics of the farmers in the study area? What are the various types of agrochemicals used by the farmers in the study area? What are the sources of agrochemicals they use? What are the effects of using these agrochemicals? What are the constraints faced in the use of agrochemicals? Hence, the study reported the socio-economic characteristics of the farmers in the study area, the various types of agrochemicals used by the farmers, the sources of agrochemicals used, the effect of using the Agrochemicals and constraint to the use of the Agrochemicals in Oyo State, Nigeria. Therefore, based on the above stated objectives, the following hypothesis was formulated and tested: There is no significant relationship between farmers' socio-economic characteristics and the effect of the use of agrochemicals among the farmers.

Materials and Methods

Study Area

The study was conducted in Oyo State. The state covers approximately 27,249 square kilometres in land area (NPC, 2006). Agriculture is the major source of income for the larger number of the people of the State. It is bounded in the south by Ogun State and in the north by Kwara State, in the west, it is partly bounded partly by Ogun State and partly the Republic of Benin and in the East by Osun State. The state lies in the equatorial rainforest belt and the rainfall around this area varies from 155mm to 1800mm per annum. There is distinct wet season from April to late October and dry season from November to March, the areas have a mean annual temperature of 26.2⁰C, the humidity is high between July and December and low

between December and February. The luxuriant forests are arranged in two or three layers consisting of undergrowth, medium higher trees and tall tree. The variety of plant species found here is one of the richest in the world (CDU Bulletin, 2007). The forest zone with high humidity favours the cultivation of tree crops such as Cocoa, Kola, Mango, Citrus and oil palm as well as arable crops like maize, cassava, Yam and Rice. The state has 33 Local Government Areas distributed into 4 ADP zones. Oyo State Agricultural Development Programme (OYSADEP) has grouped the state into four zones namely Ibadan/Ibarapa, Ogbomosho, Saki and Oyo zones designated as Zone A, B, C and D (Fasasi, 2007). The study will be conducted in Zones A of these zones.

Methodology

A four-stage sampling procedure was used for this study. The first stage is the selection of the Zone from the four agricultural zones of the state Agricultural Development Programme -OYSADP. Zone A (Ibadan /Ibarapa zone) was purposively selected for the study because the zone houses Local Government areas where agrochemicals are frequently used (OYSADP, 2013). The second stage was a purposive selection of two Local Government Areas in the zone. Egbeda and Lagelu local government areas were selected for the study.

The third stage was a random selection of 3 villages from each of the selected LGAs. And finally in fourth stage was the selection of the respondents. Twenty respondents were systematically selected from each village making a total sample size of one hundred and twenty (120) respondents. The selection was based on choosing respondent at every third house of the villages. Assistance was gotten from an enumerator in making the research work easy. The interview was conducted between November and December 2015. Data were elicited on the types, sources and effect of agrochemicals used by the farmers, as well as their socio-economic characteristics. Descriptive statistics such as precision counts, frequency, and percentage were used to describe the data collected, while inferential statistic such as Chi square was used to test the formulated hypothesis. The effect of agrochemicals used was measured through the use of likert scale such as strongly agreed, agreed, undecided, disagreed and strongly disagreed.

Results and Discussion

Socio-Economic Characteristics of the Respondents

Table 1 shows that (45%) of the respondents fall within 40-59 years, 28.3% are between the age range of 20-39 years while 26.7% were between age range of 60 years above. This reveals that most of the farmers in the study area are middle aged which may be due to less involvement of youths in farming activities.

More than half (57.5%) of the respondents were males while about (42.5%) were females. This indicates that males are mostly involved in farming activities than females. This may be because of the tedious nature of farming practices or

involvement of women in other activities like processing and trading of the farm produce. It may also be attributed to the tenure system where female right to land ownership is limited (CTA, 2007). Also majority (71.4%) of the farmers were married while 17.6%, 10.1%, 0.8% were single, widowed and divorced respectively. By this it is obvious that most of the farmers have responsibilities to discharge in their homes. About 26.7% had secondary school education, 21.7% had primary education, 5.8% had tertiary education while 17.5% had no formal education, and 14.2% had adult education and Arabic education. This implies that the farmer have the ability to acquire knowledge when information is made available. Oladele (2005) found out that exposure of farmers to education will increased the farmer's ability to adopt change. Based on the years of experience, majority of the farmers (49.2%) had between 1-10years of experience in farming activities, 25.8% had between 11-20years of experience, and 12.5% had between 21-30years of experience while 5% had over 41years of experience.

Furthermore, 90.1% of the respondent has between 0-4 hectares of farmland, 7.5% have between 4.1-8 hectare of farm land while 1.6% has between 8.1-12 hectare of farmland. This shows that most of them are small scale farmers. The implication drawn was based on the criteria set by Olayinde *et al* as cited by Ogunjimi (2012) that all farmers who operate on land less than 10 hectares are small-scale farmers.

Table 1: Socio-economic characteristics of the respondents.

Socio-economic characteristics	Frequency	Percentage
Age		
20-29 years	10.8	13
30-39 years	17.5	21
40-49years	25.8	31
50-59 years	19.2	23
60 years and above	26.7	32
Gender		
Male	69	57.5
Female	51	42.5
Marital Status		
Single	21	17.5
Married	85	70.8
Divorced	2	1.6
Widow	12	10.0
Level of Education		
No formal education	21	17.5
Adult education	17	14.2
Arabic education	17	14.2
Primary education	26	21.7

Secondary education	32	26.7
Tertiary education	7	5.8
Years of farming experience		
1-10 years	59	49.2
11-20 years	31	25.8
21-30 years	15	12.5
31-40 years	9	7.5
41 years and above	6	5.0
Farmland in hectares		
0-4	108	90.1
4.1-6	6	5.0
6.1-8	3	2.5
8.1-10	2	1.6
10.1-12	1	0.8
Total	120	100.0
Source: Field survey, 2014		
N=120		

Table 2 revealed that, 60.83% used fertilizer, 28.33% used herbicide, 8.33% used insecticides and 2.5% used fungicide. Therefore the most used agro chemical is fertilizer. This implies that fertilizer is well known by the farmers in the study area.

Type of agrochemicals frequently use

Table 2: Distribution of Respondent on the type of Agrochemicals Frequently Use.

Type of agrochemicals	Frequency	Percentage
Herbicides	34	28.33
Fungicides	3	2.50
Insecticides	10	8.33
Fertilizers	73	60.83
Total	120	100.0

Source: Field survey, 2014

Table 3 reveals that 96.67%, 2.50%, 0.83% used insecticides, fertilizer, and herbicides once in a season 70.0%, 26.67% 1.67%, 1.67% used fertilizer, herbicides, fungicides and insecticides twice in a season respectively, 70.83%, 18.33%, 10.83% used insecticides, fertilizer and herbicides are used thrice a season respectively. This implies that insecticides were the most frequently used by the farmers.

Frequency of agrochemicals' usage

Table 3: Distribution of Respondent according to frequency of use of agrochemicals

	Frequency	Percentage
Once in a season		
Herbicides	1	0.83
Fungicide	-	-
Insecticide	116	96.67
Fertilizer	3	2.50
Twice in a season		
Herbicides	32	26.67
Fungicide	2	1.67
Insecticide	2	1.67
Fertilizer	84	70.0
Thrice in a season		
Herbicides	12	10.0
Fungicide	-	-
Insecticide	85	70.83
Fertilizer	23	19.17
Total	120	100

Source: Field survey, 2014 N=120

Table 4 shows the sources of agrochemicals, and it reveals that 65.83% of the respondents sourced their agrochemicals from agrochemicals stores, 30.83% specified open market, while 1.67% got their supplies from the extension agent and fellow farmers. This indicates that the farmers have direct access to agrochemicals stores where they make purchases.

Sources of agrochemicals used

Table 4: Distribution of Respondent on sources of Agrochemicals Used

Sources of agrochemicals	Frequency	Percentage
Extension agents	2	1.67
Open market	37	30.83
Fellow farmers	2	1.67
Agrochemicals stores	79	65.83
Total	120	100.0

Source: Field survey, 2014

Table 5 revealed that 65.0% of the farmers experience crop injuries as the major effect of the use of agro chemicals, 13.33% indicated that agrochemicals causes

environmental pollution, while 12.50% and 9.17% opined that skin irritation and soil degradation respectively emanates from the use of agrochemicals. The effective use of herbicides depends to a great extent on how they are applied. More so, much of the equipment used in developing countries is poor and some designs have proved unsuitable for use (Peter, 2012)

Effect of the use of agrochemicals

Table 5: Distribution of Respondents on the effect of the use of Agrochemicals.

Effect of the use of Agrochemicals	Frequency	Percentage
Crop injuries	78	65.0
Soil degradation	11	9.17
Skin irritation	15	12.50
Environmental pollution	16	13.33
Total	120	100.0

Source: Field survey, 2014

Constraints faced in the use of agrochemicals

Table 6: Distribution of Respondents on the Constraints Faced in the use of agrochemicals

Constraints Faced	Frequency	Percentage
Inadequate access to capital	53	44.20
Inadequate know how	25	20.83
Unavailability	15	12.50
Lack of safety measures	22	18.33
Poor extension service	5	4.17
Total	120	100

Source: Field survey, 2014

Table 6 shows the constraint faced by the farmers in using agrochemicals, 44.2% of the respondents had inadequate access to capital in purchasing agrochemicals. 20.83% indicated inadequate technical knowhow, 18.33% admits lack of safety measure as a constraint, 12.50% claimed agrochemicals are not always available while 4.17% complained of poor extension services.

Test of Hypothesis

There is no significant relationship between most of the selected socioeconomic characteristics of the respondents and the effect of agrochemical usage. The study revealed no significant relationship between age of the respondents ($X^2 = 14.092$, $p > 0.05$), Gender ($X^2 = 1.003$, $p > 0.05$) Marital status ($X^2 = 8.710$, $p > 0.05$), Farming experience ($X^2 = 11.502$, $p > 0.05$) and Size of Farm land ($X^2 = 14.266$, $p > 0.05$) and

the effect of agrochemical usage. On the Other hand, there is significant relationship between Educational level ($X^2=31.43$, $p<0.05$) and the effects of agrochemical usage. Level of education is expected to have impact on the awareness and consciousness of individuals to activities around him. A farmer with no formal education will have little or no knowledge on the use of agrochemicals. This finding agrees with the report of Usman (2011) that more elite and educated farmers tend to use agrochemicals on their farms.

Table 7: Test of Hypothesis

Variables	chi-square	Degree of freedom	P-value	Decision
Age of the farmers	14.092	12	0.295	Accept
Gender	1.003	3	0.801	Accept
Marital status	8.710	9	0.464	Accepted
Level of Education	31.427	15	0.008	Rejected
Years offarming experience	11.502	12	0.486	Accepted
Farm size	14.266	15	0.284	Accepted

Source: Field survey, 2014

Conclusion and Recommendations

Evidence from the study shows a number of effects that the use of agrochemicals had on the agricultural system. Ranging from crop injuries, soil degradation, skin irritation, and environmental pollution. Based on the findings, it is recommended that farmers should be encouraged to form cooperative in order to pool resources together to solve their problems. Government should make agricultural input available and affordable to the farmers through subsidy. Training on agrochemicals usage should be enforced on all farmers so as to curb the hazardous effects of the chemicals.

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