



EcoAgroTex
RESEARCH JOURNALS

International Journal of **Eco-Agriculture** Sustainable Technologies



Publisher
Ecoagrotex Research Journals



editor.ecoagrotex@gmail.com



<https://ecoagrotex.com/index.php/ijecoast>

ISSN: 3143-6714

Limitations on arable crop producers' use of agrochemicals in Osun State

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Research Article

Date of Submission: 16-12-2025 Date of Acceptance: 29-01-2026 Date of Publication: 26-03-2026

Abstract

Owing to the possible health and environmental risks associated with the use of agrochemicals, particularly pesticides, a number of techniques have also been developed for determining their residues in a variety of environmental matrices, including soils, plants/foodstuffs, and water. Therefore, restrictions on the usage of agrochemicals by Osun State's arable crop producers were looked at. 150 farmers who grow arable crops were surveyed and interviewed as part of a multi-stage sample process. Descriptive statistics of frequency counts, percentages, and averages, as well as Chi-square and Pearson Product Moment Correlation (PPMC) at the 0.05% significance level, were used to analyse the data. The analysis's findings showed that the majority of respondents (88.7%) were men and that most of them were between the ages of 50 and 59. More than 30.7% had only completed secondary school or less, and the majority (70.0%) were married and lived in households with six to ten people. Fertiliser was used by the majority of responders (100.0%), followed by herbicides (96.0%), fungicides (92.0%), and insecticides (89.3%). Additionally, 92.0% of respondents cited insufficient finance availability as a minor barrier to the use of agrochemicals in the research region. The findings also showed a strong correlation between respondents' usage of agrochemicals and limitations ($r = 0.253$, $p = 0.002$). The research comes to the conclusion that respondents' high limitations prevented them from using agrochemicals to simplify their production operations. Therefore, it is advised that the government provide extension services to farmers in order to guide them through the use of agrochemicals and educate them about their abuse.

Keywords: Farmers of arable crops, use of agrochemicals, and limitations

Introduction

The use of agrochemicals in agricultural production has several significant advantages and has contributed significantly to the success of the "green revolution" (Briggs et al., 1989) [2] and the expansion of the food supply. The use of agrochemicals has a major impact on food production, especially in nations that sometimes experience famines. It is primarily linked to higher crop yields, animal output, and decreased post-harvest losses (Muller, 2000) [5]. Fruit, vegetable, and cereal losses due to insect damage would be 78%, 54%, and 32%, respectively, without the use of pesticides (CAI, 2008). In addition to having issues with cost-effective collection, treatment, and shipping, organic fertilizers almost typically have substantially lower quantities of plant nutrients. All crops are often grown with synthetic fertilizers, with application rates based on soil fertility, which is typically determined by a soil test and specific to the crop. While micronutrients like zinc, boron, and manganese are mostly provided by foliar sprays, major nutrients like nitrogen, phosphorus, and potassium are supplied through soil application. Diammonium phosphate, triple superphosphate, and monoammonium phosphate are examples of phosphatic fertilizers. Potassium fertilizers include potassium chloride and potassium sulfate, and nitrogen fertilizers include calcium ammonium nitrate and urea (Vitosh, 2005) [9]. The three main groups of pesticides are carbamates, organophosphates, and organochlorines. Numerous things occur when a pesticide is discharged into the environment. While releasing pesticides into the environment might sometimes be detrimental because not all of the applied chemical reaches the target location, leaking certain herbicides into the root zone can occasionally improve weed control (Cesna et al., 2005). In light of this, this study examined the degree of barriers to agrochemical usage among Osun State's arable crop producers.

Hypothesis of the study;

The null form hypothesis is put to the test:

H₀₁: The respondents' usage of agrochemicals in the research region and the limitations they experienced do not significantly correlate.

Materials and Methods:

Osun State was the location of the research. The state's land area is around 14,875 square kilometers (NPC, 2006). For the majority of the state's population (about 256,000 Farming Families), agriculture is their primary source of income. The state is located in the

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tropical rainforest belt, and the annual rainfall in this region ranges from 155 to 1800 mm. In addition to arable crops like maize, cassava, yam, and rice, the forest zone with high humidity is ideal for growing tree crops like cocoa, kola, mango, citrus, and oil palm.

Sampling Procedure and Sample size

Respondents for the research were chosen using a multi-stage sampling process. Blocks from the ADP zone that are mostly known for arable crop farmers that consistently use agrochemicals for farming in the research region were chosen using the purposeful sample technique (Iwo, Ayedire, Ola-Oluwa blocks). Ten respondents were chosen from each of the blocks' villages using systematic selection approaches, yielding a total of 150 respondents for the research.

Analysis of data: The Statistical Package for the Social Sciences (SPSS) was used to do both descriptive and inferential statistical analysis on the collected data. Frequency counts, mean, and percentage were employed as descriptive statistical tools, while Chi-square was utilized as an inferential statistical tool.

Results and Discussion

Socio-economic characteristics of respondents

Table 1: The Socio-economic characteristics of the respondents

Variables	frequency	Percentage (%)
Age		
20-39 years	33	22.0
40 – 59	101	67.3
60 and above	16	10.0
Sex		
Male	133	88.7
Female	17	11.3
Marital status		
Single	20	13.3
Married	105	70.0
Divorced	10	6.7
Widowed	15	10.0
Level of education		
No formal education	27	18.0
Adult education	21	14.0
Arabic education	9	6.0
Primary education	25	16.7
Secondary education	46	30.7
Tertiary education	22	14.7
Household size		
1-5	54	36.0
6-10	90	60.0
Above 10	6	4.0
Religion		
Christianity	84	56.0
Islam	59	39.3
Traditional	7	4.7
Income		
Less than 100,000	1	0.7
101,000- 200,000	29	19.3
201,000- 300,000	18	12.0
301,000- 400,000	23	15.3
401,000- 500,000	28	18.7
Above 500,000	51	34.0
Experience		
1-10 years	45	30.0
11-20 years	11	7.3
21-30 years	80	53.3
31-40 years	8	5.3
Above 41 years	6	4.0
Area of land (hectares)		
1-4	26	17.3
4-6	22	14.7
6-8	67	44.7
8-10	15	10.0
Above 10	6	4.0
Total	150	100

Source: Field survey, 2017.

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Table 1's analysis reveals that the majority of respondents (40.0%) were between the ages of 50 and 59. This indicates that the majority of farmers in the research region are middle-aged, which might be because younger people are less involved in farming. The results also show that 11.3% of respondents were female and 88.7% of respondents were male. This indicates that in the research region, men are more interested in farming than women. This is consistent with the assertion made by Sokoya et al. (2012) [8] that agriculture is often thought of as a male-only profession in Africa. Seventy percent of the respondents were married, according to the results. This is consistent with the assertion made by Akinbile (2007) [1] that marriage entails responsibility, which conveys a sense of maturity, adaptability, and even accountability. The majority of respondents in the study region (30.7%) had a secondary education, according to the data. This suggests that when information is made accessible, the farmer has the capacity to demand knowledge. This is consistent with the findings of Oladele (2005) [7], who discovered that farmers' capacity to accept change is enhanced when they are exposed to education. The results also reveal that the majority of respondents lived in households with six to ten people, and that the majority of respondents were Christians (56.0%), Muslims (39.3%), and traditionalists (4.7%). According to the results, the majority of respondents made more than \$500,000 annually (34.0%), followed by those who made between \$100,000 and \$200,000 (19.3%), \$401,000 and \$500,000 (18.7%), \$301,000 and \$400,000 (15.3%), and \$201,000 and \$300,000 (12.0%). The results also show that the majority of respondents (53.3%) had between 21 and 30 years of agricultural experience, and 44.7% possessed 6 to 8 hectares of land. This implied that all farmers operating on less than 10 hectares of land are small-scale farmers, according to the criterion established by Fayinde et al. as stated by Ogunjimi and Farinde (2012) [6].

Table 2: Types of Agrochemicals frequently used Agrochemical

Agrochemical	Yes	No
Herbicides	144(96.0)	6(4.0)
Fungicides	138(92.0)	12(8.0)
Fertilizer	150(100.0)	0(0.0)
Insecticides	134(89.3)	16(10.7)
Rodenticides	13(8.7)	137(91.3)

Source: Field survey, 2017, Percentage (%) in Parenthesis

The majority of respondents (100.0%) used fertilizers, followed by herbicides (96.0%), fungicides (92.0%), insecticides (89.3%), and rodenticides (8.7%), according to the study in Table 2. This suggests that respondents in the research region use fertilizers more often than other agrochemicals.

Table 3: Constraints faced in the use of Agrochemicals

Constraints	Major Constraints	Minor Constraints	Not a Constraints
Inadequate access to capital	3(2.0)	138(92.0)	9(6.0)
Unavailability of Agrochemicals	1(0.7)	53(35.3)	96(64.0)
Inadequate know how to use agrochemical	3(2.0)	28(18.7)	119(79.3)
Poor extension services	7(4.7)	23(15.3)	120(80.0)
Lack of safety measures	2(1.3)	27(18.0)	121(80.7)

Source: Field survey, 2017, Percentage (%) in parenthesis

Table 3's analysis reveals that the majority of respondents (92.0%) had insufficient capital to purchase agrochemicals as a minor constraint. Additionally, the majority of respondents (80.7%, 80.0%, 79.3%, and 64.0%) stated that the study area's lack of safety measures, poor extension services, inadequate knowledge of how to use agrochemicals, and unavailability of agrochemicals, respectively, were not a constraint.

Ho1: The impact of agrochemicals and their limitations do not significantly correlate.

Table 4: Pearson Product Moment Correlation Analys

Variable	r-value	p-value	Decision
Effect of agrochemical and Constraint	0.253	0.002	S

S= Significant at 0.05 Table 4's study showed a significant correlation between their constraint and the impact of using agrochemicals ($r = 0.253$, $p < 0.05$). This indicates that the limitations associated with using agrochemicals have an impact on how they are used in the research region.

Conclusion and Recommendations

According to this survey, the majority of respondents are married, male, in their active years, and have completed secondary school. The only significant barrier to the respondents' usage of agrochemicals was their inability to get finance to buy them. Additionally, the responders in the research region did not often use rodenticides. Therefore, the government should provide extension services to farmers so they may continue using agrochemicals in order to encourage or grow their usage. In order to guaranty that farmers have sufficient sources of technical knowledge on the safe use of agrochemicals with respect to their recommended use, human health, and the environment, appropriate and efficient routes for information distribution should be established.

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