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AN ASSESSMENT OF THE USE OF AGROCHEMICALS AMONG SMALL-SCALE FARMERS IN ESANLAND, NIGERIA

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ABSTRACT

Raising farmer's productivity has been recognized as a sustainable route to food security in Africa. Therefore, making pest control less arduous would enable the farmer's increase farm size and productivity. To this end, a survey was conducted in the 2012 farming season to determine the use of agrochemicals by farmers in Esan land, Edo State, Nigeria. Structured questionnaires were administered to farmers in the five local government areas that made up Esan land. The survey showed that most of the farmers were male (78 %) within the age of 36 – 55 (52.4 %) and 40.7 % were secondary school dropouts. Most of the farmers surveyed owned an average of 1 to 2 ha of farm land and 65 % used agrochemical products while 46% of agrochemical users used herbicide for weed control. Most farmers (88%) used between 1 - 3 Litres of various herbicidal products. Limited access to credit facilities was the major constraint to herbicide usage in Esanland. Farmers are therefore encouraged to organize themselves into cooperative societies to enable them attract incentives while Edo state government should subsidies procurement of agrochemical products.

Key words: Farmers, Esanland, Edo, agrochemical, herbicide

INTRODUCTION

Nigerian agricultural sector is dominated by small scale farmers whose farmlands varies from 0.10 – 5.99 hectares in size and constitute about 80.35 percent of all 29,800 million farm holdings in Nigeria (Ogunwale, 2005). The major problem of crop production among others include weed control (Akobundu, 1987), low soil fertility as a result of reduced fallow periods and the problem of insect pests and diseases. Effective control of these pests requires the use of agrochemicals. Over the years, various agrochemicals have contributed substantially to the control of pests thereby increasing crop productivity hence reducing food insecurity or hunger.

Herbicides are the most widely used class of pesticides in the world, accounting for 44% of all sales in 1988 and more than 90% of pesticide used in North America (Conko *et al.*, 2002). About 50% of all agrochemicals used in Nigeria are herbicides compared to insecticides and fungicides which is about 17% (Itnal *et al*., 1993). Herbicide reduces the drudgery that is associated with persistent weeds and chronic labour shortages (Ogwoche *et al.,* 2011). In the last 100 years, the use of herbicides has led to geometrical increase in world agricultural production (Anonymous, 1992) as more land is put into cultivation. However, despite all the good attributes of agrochemicals, there are some drawbacks to their use.

Agricultural activities in Esanland is dominated by cultivation of arable crops: yam (*Dioscorea*spp.), maize (*Zea mays*)), Egusi (*Citrullus vulgaris*), several vegetable crops as well as permanent crops such as rubber (*Hevea brasiliensis)*, oil palm (*Elaies guineensis*), kola(*Cola nitida*), oranges (*Citrus* spp.), plantains and bananas (*Musa* spp.) etc. Therefore, the objective of this study was to assess the level of herbicide utilization by farmers in Esanland of Edo State.

MATERIALS AND METHODS

A structured questionnaire was administered to farmers in Edo Central Senatorial District of Edo State, Nigeria which comprises five local government areas, namely, Esan South-East, Esan West, Esan North-West, Esan Central and Igueben. Three communities were selected at random in each of the local government areas and questionnaires were administered to the selected farmers in each community with the assistance of Agricultural Development Project (ADP) personnel and community leaders. Elicited information include farmer's literacy level, farm size, use of agrochemical, weed control technologies used, source of information, source of herbicide, hiring and frequency of herbicide usage in different crops. Data were analyzed and presented as percentage of released used questionnaire. Generally return rate was 100% of administered questionnaire and all were usable.

RESULTS

Socio-economic characteristics of farmers in Esanland, Nigeria

There were 450 respondents in Esanland comprising 350 males (77.8%) and 100 females (22.2%). About 52% of the farmers are between 36 and 55 years old; 34% above 50 years old and 13.6% ranged between 20-35 years old (Table 1). Majority of the farmers in Esanland owned between 1-2 hectares of farm land, about 12% had farm sizes above 2ha and 60% of the farmers practiced mixed cropping, while less than 10% cultivated one crop per farm land.

Table 1: Socio-economic Distribution of Respondent

Socio-economic characteristics	Frequency	Percentage
Male	350	77.8
Female	100	22
Age (years)		
20-35	61	13.6
36-45	123	27.3
46-55	113	25.1
≥56	153	34
Farm size (ha)		
≤1	167	37.1
1-2	229	50.9
>2	54	12.0
Farming system		
Mixed farming	136	30.2
Mixed cropping	267	59.3
Mono-cropping	35	7.8
Mixed & mono-cropping	12	2.6
Highest Educational attainment		
No formal	29	6.4
Primary school	49	10.9
School certificate drop-outs	183	40.7
Secondary school	130	28.9
Tertiary education	59	13.1
Membership of cooperative		
Yes	46	10.2
No	404	89.8
Access to credit		
Yes	45	10
No	405	90
Farming as major occupation		
Yes	245	54.4
No	205	45.6

Hundred and eighty-three of 450 respondents were secondary school dropouts, less than 10% had tertiary education. Members of agricultural cooperative societies in Esanland are about 10% of the respondents and had access to credit facilities. Overall, 54% of respondents indicate that farming is their major occupation (Table 1).

Use of agro-chemicals

Percentage frequency of respondents which had used agro-chemical was 64.5% in Esanland. Across the local government areas, Esan West had the highest percentage frequency of 73.4% followed of Esan Central with 68.4% while Esan South East had the lowest percentage frequency of about 58% (Table 2). Herbicides and fertilizers were the most used agro chemicals with 46.4% and 41.6% of respondents that used agrochemicals in Esanland; Esan west and Esan North-East local government areas had the highest respondents (Table 3). The quantity of herbicide used by most farmers was small with 88.8% of respondents using 1-3 liters or kg of product (Table 4). Farmers who used quantities of product greater than 3 L or Kg but less than 5 L or Kg of product were about 11% and most of them were in Esan west and Esan Central. Usage of herbicide among respondents was often seasonal (30.6%), than regular (24.0%) and occasional (25.4%). The regular and occasional users were more in Esan central and Esan west, respectively (Table 5).

The frequency of farmers who had discontinued the use of herbicide ranged from 3% in Esan central to 11% in Igueben local government area with mean frequency of 2.8% across Esanland while 97.2% who had used herbicide in Esanland had not abundoned its use (Table 6). About 84% of farmers using herbicides in Esanland had used it in the last 1-2 years (Table 7). While about 10% and 6% had used herbicide in the last 3-4 years and 5 years, respectively. Non availability of herbicide products (44.8% respondents),cost (28%) and poor performance (27.4%) of herbicide were among the principal reasons for stoppage of use of herbicides by few farmers across Esanland (Table 8)

Table 2: Use of agrochemicals (%)

Response	Esan South-East	Esan North- East	Esan Central	Esan West	Igueben	Total	Mean
Yes	57.8	63.2	68.4	73.4	61.9	293	64.9
No	42.2	36.8	31.6	26.6	38.1	157	35.1

Table 3: Type of agrochemical used

Type	Esan South-East	Esan North-East	Esan Central	Esan West	Igueben	Total respondents	Mean (%)
Insecticides	6	2	8	1	3	20	6.82
Fertilizers	21	26	22	31	23	122	41.64
Fungicides	1	6	5	2	1	15	5.12
Herbicides	20	31	26	37	22	136	46.42

Table 4: Quantity of agrochemical used per cropping year

Quantity (L or Kg)	Esan South-East	Esan North-East	Esan Central	Esan West	Igueben	Mean (%)
1-3	100	75	69	100	100	88.8
4-5	0	25	31	0	0	11.2
>5	0	0	0	0	0	0.0

Table 5 Frequency of herbicide use

Length of use (year)	Esan South-East	Esan North-East	Esan Central	Esan West	Igueben	Mean (%)
Regular	16	21	43	17	23	24.0
Seasonal	82	72	27	33	39	50.6
Occasional	2	7	30	50	38	25.4

Table 6 Stoppage of use of herbicide

Response	Esan South-East	Esan North-East	Esan Central	Esan West	Igueben	Mean (%)
Yes	0	0	3	0	11	2.80
No	100	100	97	100	89	97.20

Table 7 Last time (years) herbicide were used

Years	Esan South-East	Esan North-East	Esan Central	Esan West	Igueben	Mean (%)
1-2	100	100	91	82	45	83.60
3-4	0	0	9	11	31	10.20
>5	0	0	0	7	24	6.20

Table 8 Reasons for discontinuing use of herbicide

Reason	Esan South-East	Esan North-East	Esan Central	Esan West	Igueben	Mean (%)
Cost	8	17	20	23	72	28.00
Poor performance	60	0	15	62	0	27.40
Non availability	32	83	65	15	28	44.60

Table 9 Crops on which herbicides are used

Crop	Esan South-East	Esan North-East	Esan Central	Esan West	Igueben	Mean (%)
Maize	20[a]	35	25	30	18	25.60
Cassava	18	3	2	0	0	4.60
Plantain	10	5	8	11	7	8.20
Rice						
Oil palm	4	3	11	13	4	7.00
Rubber						
Yam	12	13	12	18	11	13.20
Pawpaw	0	50	0	0	0	10.00

[a] = % of farmers cultivating the crop.

DISCUSSION

Considering the age and gender distribution of farmers in Esanland, men constitute the major source of labour across the five Local Government Areas. The majority involved in farming activities are adults (aged farmers population). This is in consonance with what was reported in past surveys in most parts of Nigeria (Fadayomi, 2003; Ikuenobe *et al.,* 2005). Literacy levels among farmers surveyed were appreciable. Chikoye (2000) reported that formal education help farmers to understand the usefulness and usage of agro-chemicals while Ayeni (1991) observed that higher educational attainment could facilitate the adoption of newer technologies among Nigerian farmers, Michael and Tijani-Eniola (2009) concluded that, higher education attainment has the tendency to enhance the understanding of modern agricultural technology which could translate into large scale farming. This study showed that over 40% of respondents are secondary school dropouts. Twenty nine percent successfully completed O'level education while less than 15% had obtained tertiary education training. Thus, there is potential for higher usage of herbicides technology in Esanland.

Given the size of farm holdings, the level of usage of herbicides is very low among farmers surveyed. There was evidence that lack of access to credit was the major limiting factor to large scale farming in Esanland. There is a low level of herbicide use among farmers in Esanland. This could be due to small-land holding others opined which perceived high cost of and availability of chemicals are limiting factors to usage of herbicides and large scale farming. These findings support Brain (1990) who stated that farmers are ready to use modern agricultural inputs, but the inputs are not readily available and where available prices are far beyond the reach of the poor farmers.

CONCLUSION

The survey shows that besides provision of literacy programmes, herbicide outlet and extension service observed by Ikuenobe *et al*. (2005), farmers in Esan land need to organize themselves into cooperative societies that will be of help in accessing credit facilities. Companies and other agencies responsible for availability of herbicide should ensure proper and timely provision of chemicals to farmers while the Edo State government and ADP should make herbicides readily available and at subsidized cost to enable resource poor farmers have access to these agrochemicals.

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