



Merchants' Attitude towards the use, and Ban of the Pesticide Gammalin in Dawanau International Grain Market, Kano, Nigeria

J.A. Adegbola, E.I. Bamishaiye and F.F Olayemi

Nigeria Stored Products Research Institute, Private Mail Bag. 3032, Kano, Nigeria

E-mail : bamishaiyeunice@yahoo.com

ABSTRACT

The study seeks to know the perception and attitude of merchants towards the banned pesticide Gammalin and its use. The study was carried out in Dawanau International grain market, Kano state, Nigeria. Data was collected by the use of structured questionnaire via interview because of the high rate of illiteracy among the study population. One hundred and fourteen (114) respondents were randomly selected for the study. Investigative survey Research Approach (ISRA) and descriptive statistics were used to analyse data. The study found that 81.5% of respondents believe that the government's ban on Gammalin is uncalled for and unjustifiable. First, the respondents are of the opinion that some merchants continue to use Gammalin despite its ban because these feel the pesticide is very effective against all stored grain insects (90.3%). Secondly, merchants do not believe the dangers ascribed to its use (68.4%). Thirdly, merchants believe it is cheaper than most pesticides for stored grain pest (53.5%). Fourthly, merchants are not aware of its dangers (37.7%). Fifthly, merchants do not know of equally effective pesticides (28.9%). Lastly, merchants feel it is the pesticide they have grown up to know (14.9%). It was recommended that the government in conjunction with related non-governmental organizations do more to change merchants' attitude and perception towards Gammalin and its use especially through the mass media, enforce the legislation that bans Gammalin to the later, introduce cheap health-eco-friendly non-chemical method of combating stored grain pests like bio-pesticides, and or the Integrated Pest Management (IPM).

Key words: Gammalin, merchants, grains, ban, pesticides, IPM

INTRODUCTION

Pesticides are poisons, they are produced specifically because they are toxic to something, yet there are countless benefits associated with pesticide use. In fact, its use is believed to be one of the major factors behind the increase in agricultural productivity in the last century. According to Ecobichon [1-2] pesticides have posed a number of health problems for humans that use and handle them. Some pesticides have been banned due to the fact that they are persistent toxins which have adverse effects on humans and the environment [3]. It has been established that pesticide application in Nigeria ranges from 125,000-130,000 metric tons yearly (2009). World Health Organisation [14] maintained that an estimated 3 million farmers in developing countries experience acute poisoning from pesticide and 18000 of them eventually die from this. Nigeria is not immune to this phenomenon, 112 people were hospitalized and two children died after eaten beans preserved with pesticides in Bekwara Local Government Area of Cross Rivers state. Again, 120 students of a secondary school in Doma, Gombe State became sick as a result of eating food items contaminated by pesticides [4]. Abrahame and Brunt *et al.* [5] posit that though data on the amount of pesticide use generally in Africa is difficult to ascertain, it has been established that import of pesticide into the continent is on the increase. Nigeria ranked first according to Bull [6] among West African countries importing pesticides from the United Kingdom having imported 16,462 metric tonnes of pesticide in 1980; it accounts for about 93% of United Kingdom's pesticide exports to West African countries. According to Lee [7] 75% of all pesticide is used in developed countries and yet developing countries with just 25% of global pesticide use accounts for a disproportional number of cases of pesticide poisoning and deaths.

Due to the persistent cases of food poisoning in Nigeria purportedly caused by food made by foodstuffs contaminated by the banned pesticide Gammalin in the country as reported by Shaibu [4], Ebegbulem [8], and Yusuf [9] amongst others, we deemed it fit to specifically single out Gammalin (lindane) for this survey. Lindane, also known as *gamma*-hexachlorocyclohexane, (γ HCH), gammaxene, Gammalin and erroneously known as benzene hexachloride (BHC), is an organochlorine chemical variant

of hexachlorocyclohexane that has been used both as an agricultural insecticide and as a pharmaceutical treatment for lice and scabies [10].

Despite the fact that some known harmful pesticides have been banned by the Nigerian government, they are still been used by some handlers and merchants of agricultural commodities especially grains. It is against this backdrop that this survey seeks to assess amongst others merchant knowledge and perception of the banned pesticide lindane, generically known as Gammalin in Nigeria (lindane is a chlorinated pesticide banned in 52 countries including Nigeria. It does not breakdown easily in the environment, so it builds up in food and human bodies) with the aim of using the knowledge gotten thereof as a tool of curtailing the menace.

MATERIALS AND METHOD

The study was carried out in August 2011 in Dawanau international Grain Market in Dawakin local Government Area of Kano State. Dawanau international grain market is the biggest grain market in North-Western Nigeria, it accounts for a substantial quantity of grains export to neighbouring West African countries. It is also the hub of grain storage in this region. A simple random sampling technique was used to select 114 respondents as sample for this survey. A structured questionnaire was used for the study; data were collected through the use interview due to the high rate of illiteracy among the population under study. Statistical tools used to analyse field data include frequency distribution, percentage, and mean.

RESULTS AND DISCUSSION

Table 1 reveals that large scale grain storage is basically dominated by men; they account for 95% of respondents for this study while women make up a token 5%. Women are majorly involved in storage of grain at home level in this part of the country; this might not be unconnected with the cultural values of the area. 11.4% of respondents fall in the 20 to 30 age bracket, 18.4% falls in the 31 to 40 age bracket, 33.3% fall into 41 to 50 age bracket, while 36.8% fall into the 51 years and above age bracket, this shows that large scale storage is dominated by an ageing male population. A look into the educational attainment of respondents reveals that 35.9% of respondent have no formal education, 28.9% have primary education, and 22.8% have secondary education, while 12.2% have tertiary education. This is in tandem with Okoedo- Okojie and Onomolease, [11] position that education has a bearing on the promotion, transfer, and adoption of knowledge that boost agriculture. 80% of respondents are married, while 24.5% fall into 5 to10 years experience bracket, 27.1% fall into 16 to20 years experience bracket, and 19.2% fall into 21 years and above age bracket. This shows that respondents are well experienced and are no greenhorns in storage; their profession.

Table 2 shows that all respondents use pesticides to store their grains and only 27% of them know they can store their grains effectively without the use of pesticides. However, majority of respondents (73%) do not know they can store their grains effectively without the use of pesticides. This shows that more needs to be done in enlightening respondents on non-chemical grain storage methods and the knowledge of Integrated Pest Management (IPM) is invaluable here. IPM according to Alam et al [12] is a multidisciplinary effort based on the use of cultural, biological, and chemical techniques to control pest populations in acceptable environmentally managed methods. It provides the framework to accommodate transition from singular reliance on broad based often highly toxic, long-residual pesticides to the use of highly selective, short residual compounds without an increase in losses to pests. According to Banjo et al. [13] there is need to bring the attention of merchants to existing alternatives to pesticide use that are cost effective and environmentally friendly.

Table 3 reveals that all respondents know Gammalin, and 72% know the dangers associated with Gammalin usage, but 28% do not know. Again, 78% of respondents know that the pesticide has been banned, while 22% do not. Furthermore, 17.9% of respondents knew that Gammalin has been banned through extension agents, 44.9% knew through the mass media, 33.7% got to know from other merchants, and 3.3% cannot tell.

Table 4 shows that 18.5% of respondents believe that the ban on Gammalin is justifiable, while a greater percentage (81.5%) do not believe the ban is justifiable. This vividly is a pointer to what the attitude of the

respondents concerning the use of the banned pesticide Gammalin; it is only rational for respondents not to use Gamamlin if they are convinced the banned is justifiable and to continue its usage if they think otherwise. To this end, apart from the government banning Gammalin, it should go all out to engage in a massive enlightenment drive to win hearts and minds and justify its ban on Gammalin, it is only then (when respondents know that the government have good intentions for banning Gammalin) that they could stop its use since despite governments ban this pesticide still finds its way somehow to grain merchants and others like them.

Table 5 shows that 90.3% of respondents believe some merchants continue to use Gammalin despite its ban because they feel the pesticide is very effective against all stored grain insects, 37.7% believe that some merchants continue to use the banned chemical because they are not aware of its dangers. Furthermore, 53.5% of respondents are of the view that some merchants continue to use Gammalin because the pesticide is cheaper than most pesticide in use to control insects in grain storage, and 14.9% of respondents feel some merchants still use Gammalin because it is the pesticide they have grown up to know. Again, 64.4% of respondents think that some merchants still use Gammalin because they do not believe the numerous health hazards ascribed to its usage. Finally, 28.9% believe some merchants still use Gammalin despite its ban because they do not know of equally effective pesticide that can fight stored grain insects as Gammalin.

Table 1: Distribution of respondent by socio-economic characteristics N=114.

Variables	Frequency	Percentage (%)
Sex		
Male	108	95
Female	6	5
Age:		
20-30	13	11.4
31-40	21	18.4
41-50	38	33.4
51 and above	42	36.8
Educational level		
No formal education	41	35.9
Primary education	33	28.9
Secondary education	26	22.8
Tertiary	14	12.2
Marital status		
Single	6	5.2
Married	92	80.7
Divorced	4	3.5
Widowed	12	10.5
Business experience		
5-10 years	28	24.5
11-15 years	33	28.9
16-20 years	31	27.1
21 years and above	22	19.2

Table 2: Pesticide usage by respondents

Question	frequency	percentage
Do you pesticide to store grain		
Yes	114	100%
No	0	0
Do you know you can store your grain without using pesticides?		

Yes	31	27%
No	83	73

Table 3: Knowledge of respondents about Gammalin

Question	frequency	percentage
Do you know Gammalin?		
Yes	114	100%
No	0	0
Do you know Gammalin is very hazardous?		
Yes	82	72%
No	32	28
Do you know Gammalin has been banned?		
Yes	89	78
No	25	22
From what source did you Gammalin was banned? N=89		
From extension agent	16	17.9
Through mass media	40	44.9
From colleagues	30	33.3
Cannot tell	3	3.3

Table 4: Respondent's attitude towards the ban of Gammalin

Question	frequency	percentage
Do you think the ban on Gammalin is justifiable?		
Yes	21	18.5%
No	93	81.5

Table 5: Respondent reasons for why some merchants continue to use Gammalin

Question	frequency	percentage
What do you think is responsible for merchant use of Gammalin?		
it is very effective against all stored grain insects	103	90.3
Merchants are not aware of its dangers	43	37.7
It is cheaper than most pesticides for stored grains.	61	53.5
it is the pesticide that they have grown up to know	17	14.9
Merchants do not believe the dangers ascribed to it.	78	68.4
Merchants do not know of equally effective pesticide	33	28.9

*Reponses exceed 114 because of multiple responses from majority of respondents

CONCLUSION AND RECOMMENDATION

The study revealed that majority of the respondents (72%) know the dangers associated with Gammalin (Gammalin is dangerous to humans and the environment) as portrayed by the government. Furthermore, a greater majority of respondents (81.5%) do not believe the governments ban on Gammalin is justifiable.

Putting this into perspective, the government through extension bodies in tandem with related non-governmental institutions need to double its efforts at a re-orientation drive to win the hearts and minds of merchants with the aim of changing their perception and attitude towards Gammalin and its ban. This should be done preferably through the mass media because majority of respondents (44.9%) knew the ban on Gammalin through this source. Enforcement of legislation to restrict the availability of banned pesticides should be carried out to the later to prevent smuggling of these pesticides; illegal pesticide markets and smuggling routes should be fished out and closed. Again, safe, eco-friendly and effective pesticides should be made available to the merchants and at a low cost. Better still, merchants should be made to know and use non-chemical methods of pest control which in the long run is the best approach for preventing the use of banned pesticide. Merchants should be made to know that banned pesticide usage would lead to rejection of their grains in international markets which could lead to economic loss for the farmers and loss of foreign earnings for the country. The current trend in the use of banned pesticides despite its known dangers, and negative attitude towards its ban by merchants, and several measures to stop its use that have not yielded anticipated results calls for a radical departure from past methods. There is an urgent need to promote the use of alternative methods to protect stored grains from pest infestation; one of this is the introduction and use of bio-pesticides (bio-pesticides are naturally occurring pesticides and are derived from such natural materials as animals, plants, and some minerals). These are inherently less toxic, they pose less risk compared to chemical pesticides; they often affect the target pest and other related organisms. In contrast, broad spectrum chemical pesticides affect organisms as diverse as birds, mammals, humans, and non-target insects. Finally, it is imperative for merchants and others who use pesticides to know that non-chemical options be the first in fighting pest, and it is only when these do not yield the desired results that pesticides cautiously or and under supervision could be used, because pesticide either banned or unbanned are poisons and as such have adverse effect on people who consume products stored with them, farmers, handlers, merchants, and the environment in general.

REFERENCES

1. Ecobichon, D.J. (1996). Toxic effects of pesticides In Casarette and Doull's Toxicity. The basic science of poison, pp 26
2. Asogwa, E.U. and Dongo, L.N. (2009). Problems associated with pesticide usage and application in Nigeria cocoa production: A review. African Journal of Agricultural Research, vol4 (8), pp 675-680
3. Okunade, S.O. (2009). Control of household and Garden pest. 2nd Edition. Oladapo Idowu Printing Press, Kano
4. Shaibu, I. (2008) 'NAFDAC bans 30 agrochemical products' Vanguard, May 14, 2008. www.allafrica.com. Accessed on Wednesday, 24th August 2011
5. Abrahame, T. and Brunt (1984). An investigation into pesticide imports, distribution and use in Zambia with special emphasis on the role of multinational companies. Insect science Application, 5: 157-173.
6. Bull, D (1982). A growing problem, pesticides and the third world poor. OXFAM, Oxford. CILSS (Institut du sahel)/ CEA (Nations unies)
7. Lee, P (2006). Registering skepticism: Does the EPA's pesticides review protect children? Environmental Health Perspective 114 (10), A592-A595
8. Ebegbulem, S (2008). 'Beans sold to public contained Gammalin 20'. Vanguard, August 12, 2008. Wwww.allafrica.com. Accessed on Wednesday 24th August, 2011.
9. Yusuf, U (2010). 'Gammalin 20, not cholera caused of mass killing in Adanmawa, says Government.' Vanguard, December 17, 2010. www.vanguard.com. accessed on Wednesday 24th August 2011
10. Brandenberger, H and Maes, R A. (1997). *Analytical toxicology: for clinical, forensic, and pharmaceutical chemists*. Berlin: Walter de Gruyter. p. 243
11. Okoedo- Okojie, D.U. and E.A. Onomolease, 2009. Factors affecting the adoption of Yam storage technologies in the Northern ecological zone of Edo State, Nigeria. J. Hum. Ecol., 27(2): 155-160.
12. Alam, S.N., M.I. Hossain, F.M.A. Rouf, R.C. Jhala, M.G. Patel, L.K. Rath, A. Sengupta, K. Baral, A.N. Shylesha, S. Satpathy, T.M. Shivalingaswamy, A. Cork, and N.S. Talekar. 2006. Implementation and promotion of an IPM strategy for control of eggplant fruit and shoot borer in South Asia. Technical Bulletin No. 36. AVRDC publication number 06-672. AVRDC – The World Vegetable Center, Shanhua, Taiwan. 74 pp.
13. Banjo, A.D, Aina, S.A and Rije, O.I. (2010). Farmers knowledge and perception towards herbicides and pesticide usage in Fadama area of Okun-owa, Ogun State of Nigeria. *African Journal of basic and applied sciences* 2(5-6): 188-944
14. World Health Organisation (2000). The WHO recommended classification of pesticide by Hazard and guidelines to classification. WHO, Geneva.