Global Journal of Science Frontier Research
Agriculture & Biology
Volume 12 Issue 4 Version 1.0 April 2012
Type : Double Blind Peer Reviewed International Research Journal
Publisher: Global Journals Inc. (USA)
Online ISSN: 2249-4626 & Print ISSN: 0975-5896

Perceptions of Environmental Effects of Pesticides Use in Vegetable Production by Farmers in Ogbomoso, Nigeria

By Adeola, R. G.
Ladoke Akintola University of Technology, Nigeria

Abstract - Farmers' pest management practices, awareness and their perception about the effects of pesticides' use on the environment were discussed in this study. Data were collected from the vegetable farmers who operate along the banks of the rivers, streams and dams at the outskirts of the city. A purposive sampling technique was used to collect data from 128 vegetable farmers who use pesticides in vegetable production. Interview schedule was used to obtain data from the farmers. Frequency, means, percentages were used to describe the data and Chi – square was employed to test the relationships between some selected farmers' characteristics and their perception. Findings revealed that a wide variety of pesticides were used by the farmers. A high level of awareness on the risks associated with the use of pesticides was found among the respondents. However, majority (85%) of the farmers did not use protective clothes when applying pesticides. Farmers showed favourable attitudes about the risk of pesticide usage. Farmers' age, education and contacts with extension agent had positive and significant associations with perceived effects of pesticides use on the environment. The intensification of extension services to educate farmers on safe use of pesticides in vegetable production is recommended.

Keywords : *Pesticides; vegetable farmers; perception; safe use; environment.*

GJSFR-D Classification : *FOR Code: 070306, 059999*

Strictly as per the compliance and regulations of :

Perceptions of Environmental Effects of Pesticides Use in Vegetable Production by Farmers in Ogbomoso, Nigeria

Adeola, R. G.

Abstract - Farmers' pest management practices, awareness and their perception about the effects of pesticides' use on the environment were discussed in this study. Data were collected from the vegetable farmers who operate along the banks of the rivers, streams and dams at the outskirts of the city. A purposive sampling technique was used to collect data from 128 vegetable farmers who use pesticides in vegetable production. Interview schedule was used to obtain data from the farmers. Frequency, means, percentages were used to describe the data and Chi – square was employed to test the relationships between some selected farmers' characteristics and their perception. Findings revealed that a wide variety of pesticides were used by the farmers. A high level of awareness on the risks associated with the use of pesticides was found among the respondents. However, majority (85%) of the farmers did not use protective clothes when applying pesticides. Farmers showed favourable attitudes about the risk of pesticide usage. Farmers' age, education and contacts with extension agent had positive and significant associations with perceived effects of pesticides use on the environment. The intensification of extension services to educate farmers on safe use of pesticides in vegetable production is recommended.

Keywords : Pesticides; vegetable farmers; perception; safe use; environment.

I. Introduction

Vegetable farmers use a wide range of pesticides at different levels to reduce losses from pests and diseases. However, despite the contribution of pesticides to agricultural production, evidences in the last few decades have shown that they could also be detrimental to human health and the ecosystem (Tadesse and Asferachew, 2008).

Pesticides have substantially contributed to the controlling of pests and increasing crop yields in meeting the food demand of escalating population and control of vector-borne diseases. Exposure to pesticides is one of the most important occupational risks among farmers in developing countries (Konradsen et al., 2003; Coronado et al. 2004). One of the major factors of pesticide contamination or poisoning in developing countries is the unsafe use or misuse of pesticides. Past research have identified elements of unsafe use of pesticides as; lack of attention to safety precautions, environmental hazards, and information about first aid and antidotes given by the label, the use of faulty and proper maintenance of spraying equipment, and lack of the use of protective gear and appropriate clothing during handling of pesticides (Damalas et al., 2006 Ajayi and Akinnifesi, 2008; Sosan and Akingbohungbe, 2009).

In view of the adverse environmental effects from the unsafe pesticide use, lack of awareness of the adverse health consequences of pesticides by some farmers; it therefore becomes imperative to identify farmers' pest management practices in vegetable cultivation by investigating farmers' awareness and perceptions about the effects of pesticides use on the environment.

II. Objectives

The general objective of the study is to assess the pesticide management practices and perception of environmental effects of pesticides among vegetable farmers in Ogbomso, Oyo state. The specific objectives are to:

(i) identify pesticide utilization practices of the farmers in the study area

(ii) examine farmers' perception of environmental effects of the pesticides

(iii) determine the relationship between farmers' perception and their socio-economic characteristics

III. Methodology

Ogbomoso is a big city in Oyo state and is made up of two local Government Areas (LGAs) namely: Ogbomoso north and Ogbomoso south. The study area is located within longitude 8^0 07'N and latitude 4^0 14' E with a mean annual temperature of 26 ^{0}C, lowest temperature 24.3 ^{0}C while the highest temperature 28.7 ^{0}C. Mean annual rainfall is 1,247 mm, long wet in middle March – July, heavy rain and high humidity period, short dry in August and short wet between September and October.

Vegetables produced in Ogbomoso include leafy vegetables such as amaranthus, spinach, cochorus, okra, tomatoes, and pepper among others. The two LGAs were purposively selected for the study because of the intensive cultivation of dry season

Author : Department of Agricultural Extension and Rural Development Ladoke Akintola University of Technology, P. M. B. 4000 Ogbomoso, Oyo state, Nigeria. E-mail : adeola20022000@yahoo.

vegetables along the banks of the rivers and streams both within and outskirts of the city. Four leading vegetables like *amaranthus* spp; *celosia* spp; okra and *Corchorus olitorius* commonly produced in dry seasons were selected for detailed investigation. .Two groups of vegetable farmers from each of the two LGAs who applied pesticides to their crops were purposively selected. A list registered vegetable farmers obtained from the Oyo State Agricultural Development Programme (OYSADEP) was used to randomly select 128 farmers for the study. Interview schedule and questionnaires were used to obtain information on the extent of use of pesticides, farmers' knowledge of pesticides, and their perceptions about the pesticides' effects on the environment.

IV. Results and Discussion

The mean age of the farmers was 46.5 years with majority (54.7%) within age range of 46- 55 years. Most of the farmers had one form of education or another with majority (60.2%) having primary education. Ninety - three percent of the farmers were males while 7% were females. Majority (67.2%) of the farmers had been farming between the periods of 16 – 25 years with mean of 23.4 years. The mean farm size of the farmers was 1.6 ha. and 77.3% of the farmers inherited the farm lands on which they cultivate. Seventy – seven percent of the respondents had contact with the extension agents while 38.8% indicated non-contact with extension agent. The pesticides commonly used by the farmers were identified as Apron plus (93.8%) followed by Sevin used by 80.5% of the farmers. Other pesticides were Cypermethrin (73.4%), atrazine (19.5%), fusillade (59.4%)primextra (51.6%) and thiodan (19.5%). This is an indication that pesticides play an important role in the control of pests and increasing crop yields (Mahantesh, 2009). Sixty - two percent of the farmers used pesticides to control weeds while majority (81.3%) of the vegetable farmers used pesticides to control insects and most (93.8%) farmers used pesticides for fungi and mould control. Only 6.3% used pesticides to control rodents. This implies that farmers cultivating vegetables in the study area used pesticides at different levels. Farmers' perception of pesticides' effects on the environment include, soil destruction (54.7%), harming beneficial insects (28.1%); decrease biodiversity (61.7%) and contribute to air pollution (48.1%). About 70% of the farmers were of the opinion that pesticides pollute streams, rivers and wells while majority (80.5%) perceived that harmful side effects of pesticides on non-target animals, birds and earthworms. The study revealed that vegetable cultivating farmers in the study area were aware of various issues related to misuse of pesticides. About 74% of the farmers were aware of using banned pesticides as misuse while 85% of them had knowledge of pesticides misuse as failure to wear protective devices. Storage of pesticides in family bedroom is another misuse indicated by 26.6% of the farmers while the majority (96.1%) regarded improper disposal of pesticides containers as a misuse. The use of pesticides containers for domestic purposes was regarded as a misuse by 40.6% of the farmers and 61.7% were aware that using outdoor pesticides for household door pests. Almost 90% of the farmers had knowledge of using leaking equipment as misuse of pesticides and only 35.3% of the farmers indicated re – entry into the sprayed field as a misuse (Table 3). This high level of knowledge about pesticides' hazards which the end users of pesticides have is important for the prevention of acute poisoning (Hong Zhang, 2007).

Results in table 4 reveal that the vegetable farmers were favourably disposed toward the risk of pesticides usage to the environment. This could be seen in their level of agreement with most of the items used to measure their attitude toward the risks posed to the environment by pesticides. This favourable attitude is likely to make them more responsive to training on proper management regarding public health risks and environmental hazards.

Chi-square results show that age variable had significant association with farmers' perception. This means that old farmers are likely to perceive the environmental hazards of pesticides than the young farmers due to accumulated knowledge and experience of farming systems (Bonabana, 2002). Education also had significant influence on farmers' perception. This might be due to the ability of the literate farmers to read and follow the instructions on pesticides containers. Understanding such instructions might prevent them from misuse of pesticides such as, mixing of pesticides near different water bodies and improper disposal of pesticides containers. Farming experience was also found to have significant influence on farmers' perception. The reason for this may be due to the information on pesticides hazards which the experienced farmers might have gathered in the past years. However household size had no significant relationship with farmers' perception. A plausible reason for this may be that women and children were not involved in the sprayed activities due to their physiological vulnerability. Extension contact also had significant influence on farmers' perception and this may be due the information received from the extension agents on the environmental effects of pesticides.

V. Conclusion

The study clearly shows that farmers in the study area were quite aware of the risks associated with use of pesticides and its effects on the environment. Hence, their favourable attitude towards the risks of pesticides usage. The significant influence of extension contact on farmers' perception is indicative that extension systems must be strengthened to increase farmers' knowledge and understanding the effects of pesticides on the environment.

Table 1 : Distribution of Respondents According to Personal Characteristics n = 128

Characteristics	**Frequency**	**Percentage**
Age (Years)		
25 – 35	18	14.1
36 – 45	30	23.4
46 – 55	70	54.7
> 55	10	7.8
Total	**128**	**100**
Education		
No formal education	16	12.5
Adult Education	31	24.2
Primary education	77	60.2
Secondary education	4	3.1
Total	**128**	**100**
Sex		
Male	119	93.0
Female	9	7.0
Total	**128**	**100**
Farming experience (years)		
5 – 15	24	18.7
16 – 25	86	67.2
26 – 35	12	9.4
> 35	6	4.7
Total	**128**	**100**
Farm size (Ha)	**Frequency**	**Percentage**
0.5 –2	116	90.6
2.5 – 4	8	6.3
> 4	4	3.1
Total	**128**	**100**
Land ownership status		
Inheritance	99	77.3
Leasehold	19	14.9
Rent	10	7.8
Total	**128**	**100**

Contact with Extension Agent		
Contact	98	76.6
Non-contact	30	23.4
Total	**128**	**100**

Pesticides used by farmers in the study area n = 128

Pesticides used by farmers	*Frequency	Percentage
Apron plus	120	93.8
Atrazine	25	19.5
cypermethrin	94	73.4
Sevin	103	80.5
Thiodan	25	19.5
Fusilade	76	59.4
Primextra	66	51.6

** Multiple responses*

Pesticides practices of farmers n = 128

Purpose of pesticides application	*Frequency	Percentage
Weed control	62	48.4
Insect pest control	104	81.3
Rodent control	8	6.3
Fungi/mould control	120	93.8

** Multiple responses*

Farmers' perception of pesticides effects on the environment n = 128

Items	*Frequency	Percentage
Destroy soil by reducing its quality	70	54.7
Harming beneficial insects (bees)	36	28.1
Decrease biodiversity	79	61.7
Contribute to air pollution	77	48.1
Pollute streams, rivers & wells.	89	69.5
Harmful side effects on non-target organisms (birds, animals earthworms).	103	80.5

** Multiple responses*

Farmers' knowledge about misuse of pesticides n = 128

Items	*Frequency	Percentage
Using of banned agricultural pesticides	95	74.2
Failure to wear protective clothes/equipment	109	85.2
Storage of pesticides in family bedroom	34	26.6
Improper disposal of pesticides containers	123	96.1
Using pesticides containers for domestic purposes	52	40.6
Use outdoor pesticides for household door pests	79	61.7
Use of leaking equipment	115	89.8
Re – entry into the sprayed field	49	35.3

** Multiple responses*

Table 4 : Attitude of respondents towards the risk of pesticide usage n = 128

Statement	Means	Standard deviation
Pesticides will not only reach the target organisms but will also kill other organisms (e.g. beneficial insects, birds, earthworms, fish) in or around the crop fields	4.38	0.889
Pesticides cause loss of biodiversity, deaths of wild life, and death of farm animals.	3.70	0.999
Soil, air and water bodies can easily be contaminated with these poisonous chemicals.	4.19	0.801
The unavoidable destruction of beneficial insects and spiders interferes with natural pest control.	3.15	.878
Pesticides usage causes resurgence of pest population after removing natural enemies.	4.37	.904
Farmers' exposure to pesticides can cause dizziness, reduce coordination and ability to think.	4.11	.806
Natural resources can be degraded when water runoff enter streams or leach into groundwater.	3.55	.895
Pesticides residue in food could not result in death	4. 12	1.062
A major factor of pesticide contamination or poisoning is not the unsafe use or misuse of pesticides	2.67	1.124
Spraying for weeds during the hottest part of the day when herbicide drift or volatilization can damage other garden plants, including our neighbour's.	3.64	1.379

Strongly Agree = 5, Agree = 4, Undecided = 3, Disagree = 2, Strongly Disagree = 1. Any mean score ≤ 3 suggests disagreement with the it em statement. Any mean score ≥ 3 suggests agreement with the item statement.

Results of Chi-square showing associations between farmers' perception and the selected farmers' characteristics N = 128

Variable	X^2 - value	df	p - value	Decision
Age	72.734	28	.003	Significant
Education	54.906	5	.000	Significant
Farming experience	131.641	28	.000	Significant
Household size	64.578	16	.104	Non-significant
Contact with extension agent	81.344	21	.000	Significant

References Références Referencias

1. Ajayi, O.C. & Akinnifesi, F.K.(2008). Farmers' understanding of pesticide safety labels and field spraying practices: a case study of cotton farmers in northern Cote d'Ivoire. *Sci. Res. Essays* 2., 204-210.
2. Bonabana-Wabbi, J. (2002). Assessing Factors Affecting Adoption of Agricultural Technologies:The Case of Integrated Pest Management (IPM) in Kumi District, Eastern Uganda. Unpublished M.Sc. Thesis, Virginia Polytechnic Institute and State University.
3. Coronado, G.D.; Thompson, B.; Strong, L.; Griffith, W.C.; Islas, I. (2004). Agricultural task and exposure to organophosphate pesticides among farm workers. *Environ. Health18 Persp.*, 112., 142-147.
4. Damalas, C.A.; Georgiou, E.B.; Theodorou, M.G. (2006). Pesticide use and safety practices among Greek tobacco farmers: A survey. *Int. J. Environ. Health Res.* 16., 339-22 348.
5. Hong Zhang and Yonglong Lu (2007). End-users' knowledge, attitude, and behavior towards safe use of pesticides: a case study in the Guanting Reservoir area, China. *Environmental Geochemistry and Health* 29:(6): 513-520.
6. Konradsen, F.; Van der Hoek, W.; Cole, D.C.; Hutchinson, G.; 1 Daisley, H.; Singh, S., Eddleston, M. (2003). Reducing acute poisoning in developing

countries-options for restricting the availability of pesticides. *Toxicology,* 192: 249-261.

7. Mahantesh, N.+ and Alka Singh (2009), A Study on Farmers' Knowledge, Perception and Intensity of Pesticide Use in Vegetable Cultivation in Western Uttar Pradesh *Pusa AgriScience* 32: 63-69
8. Soares, W.; Almeida, R.M.V.R.; Moro, S. (2003). Rural work and risk factors associated with pesticide use in Minas Gerais, Brazil. *Cad. Saúde Pública.,* 19., 1117-1127.
9. Sosan, M.B. & Akingbohungbe, A.E. (2009). Occupational insecticide exposure and \perception of safety measures among cacao farmers in southwestern Nigeria. *Arch.Environ. Occup. Health,* 64., 185-193.
10. Tadesse, A. and Asferachew, A. (2008), An Assessment of The Pesticide Use, Practice And Hazards in The Ethiopian Rift Valley. Africa Stockpiles program, Annex 6, 61p.

Global Journals Inc. (US) Guidelines Handbook 2012

www.GlobalJournals.org