

**POLICY GUIDELINES ON
PEST AND VECTOR CONTROL**

DEVELOPED BY

**FEDERAL MINISTRY OF ENVIRONMENT
ABUJA**

JULY 2004

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PREFACE

Pests and disease vectors constitute serious hazards to public health, food security and general welfare of the citizenry in Nigeria. It is estimated that agricultural pests destroy about 50% of crops, fruits, ornamental plants, vegetables and livestock annually. Household pests also destroy property such as furniture items, clothing, books, etc. Estimated cost of damage caused by pests runs into millions of Naira annually.

Vectors transmit several diseases of public health importance in Nigeria. Malaria which is transmitted by the Anopheles mosquitoes, is responsible for considerable morbidity and mortality particularly among children less than 5 years and pregnant women. Onchocerciasis (River Blindness) transmitted by Black flies is responsible for the high incidence of blindness in most rural and remote areas of Nigeria. This disease has resulted in depopulation of many fertile farming areas thus contributing significantly to food insecurity and poverty. Lassa fever and Yellow fever transmitted by *M. natalensis* (rats) and *Aedes* mosquitoes respectively have been reported to occur in epidemic proportions in some parts of Nigeria.

Other vector borne diseases, such as Schistosomiasis, Trypanosomiasis (sleeping sickness) and Dracunculiasis (guinea worm) continue to exert heavy morbidity and mortality burden especially in rural communities of Nigeria. There is therefore, an urgent need to develop Policy Guidelines that will provide a clear focus for the control of pests and vectors in Nigeria.

The Policy Guidelines on Pest and Vector Control has thus laid out the key strategies necessary to achieve the ultimate goal of reducing the threats posed by pests and vectors to public health and the environment. It has also assigned roles to all Stakeholders and proffered various environment friendly measures for Pest and Vector Control.

Last but not the least, recommendations for establishing Pest and Vector Control Outfits, licensing of pest and vector control operators, as well as health and safety issues in pesticide use have been stated. The implementation of this Policy Guidelines will no doubt stem the disease burden and economic losses associated with pests and vectors.

Col. Bala Mande (rtd)

Honourable Minister of Environment

July 2004

1.0 INTRODUCTION

- 1.1 The term "pest" refers broadly to any organism that is troublesome, noxious or destructive. Pests include a variety of bird species, mites, ticks, nematodes, ants, wasps, bees, locusts, termites, plant and animal pathogens and parasites, nuisance wild animals (e.g. venomous snakes and elephants), rats, mice, snails, cattle, weeds etc. In Nigeria, agricultural pests destroy about half (50%) of crops annually; especially grains, ornamental plants, fruits, vegetables etc, and livestock before and after harvest. This massive destruction inevitably results in poor harvest and low income for farmers and these in turn lead to poor nutrition for the citizenry, starvation and food insecurity. Pests in households also destroy property such as furniture items, wooden parts of buildings, clothing, books, etc. Estimated cost of damage caused by agricultural and household pests runs into millions of Naira annually.
- 1.2 A vector is an organism (vertebrate or invertebrate) that is capable of transmitting germs from one person to another or from animal to man, in the case of zoonoses. Disease vectors of Public Health importance in Nigeria include: *Anopheles*, *Aedes* and *Culex* species of mosquitoes; tse-tse flies (*Glossina* spp.); black flies (*Simulium* spp.); sand flies (*Phlebotomus* spp.); deerflies (*Chrysops* spp.); the housefly (*Musca domestica*); cockroaches (*Periplanata* spp. and *Blatta* sp.); body, head and pubic lice (*Pediculus humanus*, *P. capitis* and *Pthirus pubis*); crustaceans, crabs, crayfish and cyclops; mites; ticks; freshwater snails (*Bulinus* and *Biomphalaria* spp); and rats (*Rattus rattus*, *Rattus norvegicus* and *Mastomys natalensis*).
- 1.3 *Anopheles* mosquitoes are the vectors of malaria, a life threatening parasitic disease that kills more than a million persons globally. About 90% of these deaths occur in Africa, mostly among young children. It is Africa's leading cause of under-five mortality, accounting for an estimated 20% of the deaths in the age group. It is also responsible for 10% of the continent's

overall disease burden and accounts for 40% of Public Health expenditure, 30-50% of in-patient admissions and about 50% of outpatients' visits in hyper-endemic areas. In Nigeria, it accounts for about 26% of infant mortality, 30% under-five mortality and 11 % maternal mortality annually (FMOH and UNICEF, 2002). In addition, malaria has significant direct and indirect economic consequences including low productivity, school absenteeism, increased poverty level and low general economic development. Other mosquito-borne diseases of public health significance in Nigeria include Yellow Fever, Filariasis, Dengue Fever and Arboviral Infections.

- 1.4 Schistosomiasis is an endemic parasitic disease transmitted through active penetration of the human skin by the cercaria. This intermediate host is in the family of snails called *Bulinus*, which lives in slow moving and stagnant water. Infection is characterized by painless passing of blood in the urine towards the end of micturition. The infection causes fibrosis of the urinary bladder, eventually leading to secondary kidney failure if untreated. It rarely leads to anemia. School children who swim or wade through contaminated water or fetch water from contaminated pools or streams are commonly affected. In the northern most borders of Nigeria (Sokoto stretching to Borno), Schistosomiasis endemicity is over 20% of the total population (FMOH, 2002).

- 1.5 Onchocerciasis (River Blindness) is transmitted by the bite of infective female black flies (*Simulium* spp.). As the name implies, the disease causes premature blindness in sufferers in addition to a variety of disfiguring skin lesions (e.g. leopard skin). The disease vector breeds in remote, rural areas with fast-running streams and rivers. As a result of this, several areas of arable land in Nigeria have been abandoned by farmers thus creating serious economic, agricultural and social problems. Infection is widely distributed in Nigeria affecting 20 to 25 million in 32 States of the Federation including the Federal Capital Territory (FMOH, 2003).

1.6 Dracunculiasis (Guinea worm) is a water borne parasitic infection transmitted from one person to another, through the drinking of polluted water that is contaminated with infected water fleas called Cyclops. The infective larvae of the worm called *Dracunculus medinensis* is released from the fleas in the stomach from where it migrates and lodges itself in the body tissue, especially in the legs where it undergoes maturation. The adult female worm subsequently emerges at the skin surface forming a blister which bursts when immersed in cold water, releasing large numbers of its off springs into the water.

Guinea worm infection is still endemic in some States of Nigeria despite the gains of the Nigeria Guinea Worm Eradication Programme (NIGEP). In 2003 up to 1459 new cases were reported (FMOH, 2003). This disease has multiple adverse effects on health, education and economic activities especially in the rural areas. The social and economic effects of the disease are attributed mainly to the temporary disability suffered by infected persons. The most vulnerable are women and children who collect water at wells and ponds as well as farmers at the beginning of the rains. This interferes with planting and thus undermines food security.

1.7 Apart from these four major diseases, several other vector-borne diseases collectively exert a heavy burden in terms of morbidity, mortality, poverty and other direct and indirect social and economic costs on the citizenry.

2.0 **AIM**

To control pests and vectors in the environment that constitute threats to public health and property.

3.0 **OBJECTIVES**

3.1 To establish and strengthen Pest and Vector Control Units at the three tiers of Government.

- 3.2 To control pests and vectors in households, offices, food premises, industries, agricultural farms and the environment in general
- 3.3 To evolve sustainable Pest and Vector Control systems.
- 3.4 To regulate the activities of Pest and Vector Control operators.
- 3.5 To establish surveillance mechanisms for monitoring toxic effects of pesticides on the eco-system and public health.
- 3.6 To establish and strengthen surveillance mechanism for monitoring pests and vectors in the environment.

4.0 JUSTIFICATION

- 4.1 Annually, agricultural pests destroy up to 50% of crops especially grains, vegetables, fruits, and livestock before and after harvest. This massive destruction contributes to poverty, poor nutrition, starvation and food insecurity.
- 4.2 Other pests, such as venomous snakes - *Echis carinatus ocellatus*, contribute to significant morbidity and mortality in the Niger-Benue valley of Nigeria. At the peak of the farming season, it is not uncommon to find hospital beds almost completely taken over by snakebite victims in the area.
- 4.3 Pests such as the multi-mammate rat transmit Lassa fever, a fatal disease that has caused several epidemic episodes in some parts of the country.
- 4.4 Vector-borne diseases constitute major health problems in Nigeria. Malaria remains one of the five leading causes of morbidity and mortality among children below the age of five years and pregnant women.
- 4.5 Other important endemic vector-borne diseases such as Schistosomiasis, Onchocerciasis (River Blindness) and other filariases; Yellow Fever, Guinea Worm and Trypanosomiasis (sleeping sickness) have devastating social, economic and political consequences. They account for significant economic loss thus contributing considerably to poverty and underdevelopment.

- 4.6 The massive and widespread use and abuse of pesticides to control pests and vectors have serious consequences on the quality of the environment and public health.
- 4.7 Pests and vectors thus contribute significantly to morbidity and mortality and also exacerbate poverty and under-development. Therefore, evolving realistic, affordable and ecologically safe means of control will reduce the national burden of vector-borne diseases and free resources for other developmental programmes. In addition, the reduction of pests will produce greater agricultural yield, reduce poverty and promote economic growth.

5.0 STRATEGIES

- 5.1 Develop Policy Guidelines for sustainable Pest and Vector Control activities in line with the National Development Objectives.
- 5.2 Foster collaboration among key Stakeholders (Ministries of Health, Agriculture, Science and Technology, Water Resources, Academic and Research Institutions, Industries, end users, etc.) on issues of Pest and Vector Control.
- 5.3 Support research into environment friendly methods of Pest and Vector Control.
- 5.4 Sensitize and mobilize communities on the significance of pests and vectors as well as the environment friendly methods for their control.
- 5.5 Facilitate the establishment/strengthening of Pest and Vector Control Units in relevant Ministries, Agencies and all tiers of Government.
- 5.6 Foster private sector participation in Pest and Vector Control.
- 5.7 Establish a comprehensive inventory of pests and vectors of public health importance and their bionomics in the different ecological zones of Nigeria.
- 5.8 Develop Code of Practice for Operators of Pest and Vector Control outfits.

6.0 INSTITUTIONAL ROLES

6.1 The Federal Ministry of Environment (FMENV) shall:

- 6.1.1 Develop a comprehensive inventory of pests and vectors of public health importance and their bionomics in the different eco-climatic zones.
- 6.1.2 Develop Codes of Practice for Operators of Pest and Vector Control outfits.
- 6.1.3 Provide technical assistance and logistic support to States and LGAs on Pest and Vector Control.
- 6.1.4 Develop Information, Education and Communication (IEC) materials for Pest and Vector Control in consultation with States
- 6.1.5 Build capacity and ensure institutional strengthening for Pest and Vector Control.
- 6.1.6 Prepare in collaboration with relevant Stakeholders, Emergency Pest and Vector Control Plan of Action in case of massive pest and vector invasion.
- 6.1.7 Encourage private sector participation in Pest and Vector Control services
- 6.1.8 Conduct annual Monitoring and Evaluation of Pest and Vector Control Programmes.
- 6.1.9 Collaborate with relevant Ministries (Agriculture, Health, Science and Technology etc.) on research into better methods of Pest and Vector Control

6.2 Federal Ministry of Agriculture shall:

- 6.2.1 Collaborate with Federal Ministry of Environment in the development of Codes of Practice and IEC materials for Pest and Vector Control operators.
- 6.2.2 Collaborate with Federal Ministry of Environment in the continuous review of the Policy guidelines on Pest and Vector control.

6.3 The Federal Ministry of Health shall:

- i. Collaborate with the Federal Ministry of Environment to develop a comprehensive inventory of pests and vectors of public health importance

6.4 The Federal Ministry of Science and Technology shall:

- i. Collaborate with the Federal Ministry of Environment to undertake research, foster the development and dissemination of new and better methods for pest control.

6.5 The State Ministries of Environment shall:

- 6.5.1 Support and ensure the implementation of the Policy Guidelines on Pest and Vector Control
- 6.5.2 Generate data on Pest and Vector Control activities in the State.
- 6.5.3 Supervise and coordinate Pest and Vector Control programmes at the Local Government level.
- 6.5.4 Provide technical support to LGAs.
- 6.5.5 Carry out advocacy at the State level.
- 6.5.6 Conduct periodic monitoring and evaluation at the Local Government levels
- 6.5.7 Adapt in collaboration with Stakeholders, the Emergency Pest and Vector Control Plan of Action for the State.
- 6.5.8 Build capacity of Pest and Vector Control personnel.
- 6.5.9 Sensitize and mobilize communities using Information, education and Communication (IEC) materials.
- 6.5.10 Encourage private sector participation in Pest and Vector Control services
- 6.5.11 Prepare quarterly report on Pest and Vector Control activities and send to the Federal Ministry of Environment

6.6 State Ministry of Agriculture shall:

- 6.6.1 Collaborate with State Ministry of Environment and other relevant Stakeholders in dissemination of IEC materials to the communities.
- 6.6.2 Support Federal Ministry of Environment in generating data on Pest and Vector Control activities in the State.

6.7 The Local Governments shall:

- 6.7.1 Carry out routine Pest and Vector Control activities in the communities.
- 6.7.2 Ensure private sector participation in Pest and Vector Control activities.
- 6.7.3 Sensitize and mobilize communities using IEC materials.
- 6.7.4 Make annual budgetary provisions for Pest and Vector Control activities
- 6.7.5 Monitor the activities of Pest and Vector Control Operators and ensure compliance with the guidelines and codes of practice
- 6.7.6 Supervise and coordinate Pest and Vector Control activities at community level.
- 6.7.7 Render monthly reports on Pest and Vector Control activities and forward to State

6.8 Private Sector shall:

- 6.8.1 Comply with the provisions of the National Policy Guidelines on Pest and Vector Control.
- 6.8.2 Comply with the Codes of Practice for Operators of Pest and Vector Control outfits.
- 6.8.3 Participate in Pest and Vector Control Services on cost recovery basis.
- 6.8.4 Engage in partnership with Local Governments for better service delivery.
- 6.8.5 Undertake and support research, specialized studies and product development in Pest and Vector Control.
- 6.8.6 Promote public enlightenment campaigns.

6.9 Civil Society Organisations shall:

- 6.9.1 Undertake grassroots mobilization to participate in Pest and Vector Control
- 6.9.2 Promote Pest and Vector Control at household level.
- 6.9.3 Promote public enlightenment campaigns on appropriate strategies for Pest and Vector Control.

6.10 The Public shall:

- 6.10.1 Adopt environment friendly habits and practices.
- 6.10.2 Comply with existing laws and regulations on Pest and Vector Control.
- 6.10.3 Comply with the provisions of this Policy Guidelines
- 6.10.4 Cooperate with other Stakeholders to ensure sustainable Pest and Vector Control.
- 6.10.5 Pay the requisite fees for Pest and Vector Control services to ensure sustainability.

7.0 PEST AND VECTOR CONTROL MEASURES

The control measures for pests and vectors include:

7.1 ENVIRONMENTAL CLEANLINESS:

- 7.1.1 The elimination of breeding sites or hide outs eg. clearing of drains, canals, etc.
- 7.1.2 Removing their sources of food eg. prompt clean up after cooking, regular garbage pickup, etc
- 7.1.3 Environmental cleanliness is very effective for controlling pests and vectors and can lead to eradication, which can be sustained through health education and community sensitization.

7.2 **TRADITIONAL METHODS:**

7.1 Time tested and effective cultural and traditional methods of Pest and Vector Control eg. use of certain plants or the rearing of certain animals that repel pests and vectors.

7.3 **BIOLOGICAL CONTROL:**

7.3.1 The use of natural enemies of pests and vectors such as plants, parasites, predators and pathogens;

7.3.2 The use of plant extracts is a safe and environment friendly method to be used by skilled personnel;

7.3.3 Biological control does not usually lead to eradication.

7.4 **MECHANICAL OR PHYSICAL CONTROL:**

7.4.1 The use of devices, machines, barriers and other mechanized methods to control pests or alter their environment eg. traps, screens, fences, nets, radiation, electricity, etc.

7.4.2 This safe and environment friendly method is effective as long as the device is intact, but does not usually lead to eradication

7.5 **CHEMICAL CONTROL:**

7.5.1 The use of chemicals to destroy pests, control their activity or prevent them from causing damage.

7.5.2 Pesticides either kill or repel the pests and are therefore, the fastest ways to control pests.

7.5.3 The use of non persistent and other environment friendly chemicals shall be enforced

7.5.4 This method can effectively control pest and vector population with eventual eradication.

8.0 GUIDELINES FOR ESTABLISHING PEST AND VECTOR CONTROL OUTFIT

8.1 THE PEST AND VECTOR CONTROL OUTFIT

8.1.1 Provides services to residential homes, companies, food premises, industries, offices and agricultural farms on fee for service basis;

8.1.2 Employs the services of a professional Pest and Vector Control technician who shall be knowledgeable in all areas to provide environmentally safe and effective control services;

8.1.3 Employs the services of a trained technician/repairer to maintain all equipment;

8.1.4 Provides a designated office for attending to customers who require Pest and Vector Control services;

8.1.5 Provides a designated store for keeping equipment and chemicals. The store shall be free from hazards, fire resistant, well ventilated, well lit, and shall

- be locked when not in use. The store shall have adequate shelving arrangement and the floor shall be made of impervious material;
- 8.1.6 Places a "fire code" sign on the door of the chemical store;
 - 8.1.7 Ensures availability of fire extinguisher nearby;
 - 8.1.8 Ensures appropriate ventilation in the chemical storage area;
 - 8.1.9 Makes available material safety data sheet for all chemicals stored;
 - 8.1.10 Ensures that all chemicals are clearly labeled and handled with caution;
 - 8.1.11 Conducts regular checks on all pesticides containers for signs of leakage, damage and deterioration of contents;
 - 8.1.12 Ensures that the pesticide application equipment is thoroughly cleaned and made free of pesticide residue after use;
 - 8.1.13 Ensures that equipment is well maintained and free of leaks;
 - 8.1.14 Ensures that containers are emptied, thoroughly rinsed and rendered unusable before disposal through the municipal waste management system or incineration (if there is no restriction);
 - 8.1.15 Makes available to the operators, appropriate and adequate quantity of personal protective equipment such as respirators, nose mask, goggles, gloves, boots, long sleeve overall coats and helmets. Soap, water and towel shall be available at all times for the use of operators;
 - 8.1.16 Provides an appropriate vehicle for the pest control outfit. Drivers' cabin of the vehicle must be separated from chemicals and equipment compartment;
 - 8.1.17 Makes available materials for keeping adequate record of pesticides available, date of application, site address and pesticide used;
 - 8.1.18 Issues appropriate certificate after each Pest and Vector Control exercise;
 - 9.1.19 Stocks spare parts for equipment maintenance.

8.2 GUIDELINES FOR EQUIPMENT AND CHEMICALS.

8.2.1 Equipment

- 8.2.1.1 Original knapsack sprayer — manual sprayer mounted on human back to spray drains, stagnant water bodies and the interior of buildings;
- 8.2.1.2 Motorised or mechanical sprayer — used on large breeding water surface of canals where it is impossible to treat manually;
- 8.2.1.3 Swing fog machine — used to spray the exterior environment (atmosphere and garden space) of an already fumigated building. It oozes out chemical-smoke as against moisture released by knapsack or motorized sprayer. It can also be used to attack or disperse locust and quiller birds in the farm.

8.3 Chemicals

8.2.2.1 Pesticides - Generic group names commonly used.

- i. Pyrethroids - have faster knockdown effects and very long residual action as a surface spray. Pyrethroids have faster knockdown effects especially on flies, mosquitoes and cockroaches;

- ii. Organophosphates - also called "Ops" have extensively been used in Pest and Vector Control. It should be applied with caution as it is toxic to untargeted mammals and humans. Most organophosphates deteriorate rapidly and therefore pose no problem of long-term environmental contamination or effects. Some "Ops" are good and can be used as larviciding agents against mosquito larva;
- iii. Carbamates insecticides have a similar mode of action to the organophosphates. Generally, carbamates such as carbaryl (Sevin), propoxur (Baygon) and bedniocarb (Ficam) have even lower toxicity to mammals than most organophosphates. Carbaryl has by far the largest use owing to its low mammalian toxicity and relatively wide spectrum activity. Propoxur is popularly used in the home against cockroaches.
- iv. Botanicals are natural insecticides derived from plants. Botanicals include Pyrethrum, Rotenone, Ryania, and Nicotine. Pyrethrum is an oily substance extracted from certain varieties of chrysanthemum plant. They are often used in combination with synergists such as piperonyl butoxide. They have faster knock down effects and usually of low toxicity to mammals but quite toxic to most fish, birds, reptiles and amphibians.
- v. Fumigants are gaseous pesticides whose vapours enter the pest system via inhalation. Fumigants are used in food and grain storage facilities, Ports and National borders. Food and grains must be well covered with polyethylene material if evacuation is not feasible. Fumigants are toxic to all forms of life, plants and animals. Faulty application may result into a catastrophe, killing living plants and corroding metal surfaces. It is therefore, imperative that the operators check available products literature to ensure a safe fumigation exercise;
- vi. Rodenticides are poisons which kill rodents. They come in various forms such as granules, powder, cakes, etc. It is of utmost importance that the pest control operator knows and understands rodenticides and adheres strictly to label instructions when applying them. Safety considerations must be adhered to as most rodenticides are highly toxic and can be fatal if ingested in very small quantity by humans.

9.0 LICENSING OF PEST AND VECTOR CONTROL OPERATORS

9.1 To encourage private sector participation in Pest and Vector Control for sustainability, the Local Government shall license private Pest and Vector Control Outfits. The Department shall regulate the private sector operators to ensure compliance with standards.

9.2 Recommended Criteria for Licensing Private Sector Participants:

9.2.1 To operate a private Pest and Vector Control Outfit in any LGA, the Outfit shall:

- i. Provide evidence of registration of business name.
- ii. Have a qualified technician in charge; the technician must hold the relevant qualifications.
- iii. State the type of Pest and Vector Control activity to be provided
- iv. Pay the requisite fees.
- v. Renew the license annually.
- vi. Attend regularly workshops/training organized by the Local Government on Pest and Vector Control.

9.2.2 The Local Government shall:

- i. Inspect the office and stores of the private sector participant to ascertain the following:
 - a. Adequate provision of equipment (compressed, mechanical, swing fog machines, etc).
 - b. Adequate storage of approved chemical and quality control. (List of approved chemicals).
 - c. Manpower outlay.
- ii. Ensure submission of monthly reports of operations carried out to the State.

10.0 HEALTH AND SAFETY CONSIDERATIONS IN PESTICIDE USE

The use of pesticides (i.e. insecticides, herbicides, fungicides, molluscicides and rodenticides) in vector control requires technical skills, equipment, considerable financial input and above all, great care and precaution in application of the various toxic organic, inorganic, natural and synthetic chemicals. Numerous cases of pesticide poisoning among Public Health field workers have been reported all over the world including Nigeria. Potential users at institutional, community and individual levels shall therefore:

- 10.1 Undergo training in techniques for pesticide application in their various formulations using a variety of equipment.
- 10.2 Pay special attention and care on PACKAGING, LABELLING, STORAGE, and DISPOSAL OF USED PESTICIDE CONTAINERS.
- 10.3 Destroy all empty pesticide containers using a suitable incinerator or bury in a hazardous waste disposal site.
- 10.4 Use appropriate personal protective equipment such as respirators, nose masks, goggles, gloves, boots, long sleeve overall coats and washable hats, while carrying out pest control operations.
- 10.5 Enforce observance of adequate personal hygiene through the provision of soap, water and towel at all times during operations.
- 10.6 Ensure that no smoking, eating or drinking is undertaken during operations.
- 10.7 Undertake periodic biological monitoring especially cholinesterase levels if organophosphate pesticide is frequently handled.
- 10.8 Ensure that all chemicals are kept out of the reach of children.

LIST OF COMMON CHEMICALS FOR USE IN DOMESTIC PEST AND VECTOR CONTROL

Name	Chemical Class	Active Ingredient	Other names	Activity	Toxicity
<u>INSECTICIDE</u>					
Diazinon	Organophosphate	Dichlovors 2,2, dichlorovinyl. O-O dimethy phosphate	Dipofene Diazitol	Broad spectrum	Low, relatively biodegrdable, will not bio-accumulate
Karate	synthetic pyrethroid	Lambda Cyhalothrin		Broad Spectrum	Low
Cypermtrin	synthetic pyrethroid		Cynoff; Demon	Broad Spectrum	Low
Pyrinex	Organophosphorus	O.O. Diethyl,O,3,5 tricholor-2-pyridyl phosphorothiotate	Chlopyrifos	Broad Spectrum	High, also toxic to aquatic organisms
Fenthion,	Organophosphate	Phosphorothioic Acid, O,O- Dimethyl O (3- Methyl-4- Methylthio); Phenyl Ester	Baytex; Entex; Lebaycid	Broad Spectrum	High, Toxic to birds, Bio-accumulates in the environment
Abate	Organophosphate	Temephos	Abat, Abate, Abathion, Acibate, Biothion, Bithion, Difennthos, Ecopro, Nimitox,	Broad Spectrum	High

Name	Chemical Class	Active Ingredient	Other names	Activity	Toxicity
Fluazitop (Reptile repellents)	Organophosphorus	Methidathion sp s- (2,2,dihydro 5, methoxy-2,-0 -x- 0.1,3,4 thadioxo - 3-yl - methoxyl 0,0- dimethyl phosphoro dithioate	-	Broad Spectrum	High but moderate to mammals
Microcide (Odour/Bacteria Control)		2,2, dimethyl Cyclopropane Formaldehyde - Gloccol, Biodidepharm	-	Bacterial Control	Low
<u>RODENTICIDE</u>					
Zinc Phosphide	Inorganic rodenticide		Arrex, Denkarin Grains, Gopha- Rid, Phosvin, Pollux, Ridall, Ratol, Rodenticide AG, Zinc-Tox ZP.	Broad Spectrum	Highly toxic (Poison) to birds, aquatic animals and man. Liberates phosphine, a highly toxic gas
Brodifacoum (Anti-coagulant)	Organobromine (Bromylated Coumarin compound)		Ratol Volak	Broad Spectrum	Low. Care with children and people with bleeding disorders

Name	Chemical Class	Active Ingredient	Other names	Activity	Toxicity
<u>MOLLUSCICIDES</u>					
Furadan 5 G Basudin	Carbamate (reversible cholinesterase inhibitor.)	Carbofuran	Carbodan 48 F; Curater 4 F; Curater 47; Furadan 47 F; Furadan 48 F, Furadan 480 F; Furadan 480 g/L SC; Furadan 4 Flo	Insecticide nematicide	Highly toxic to human and aquatic animals. Biodegradable with low tendency to bio-accumulate Antidote: Atropine
<u>HERBICIDE</u>					
Propanil-based herbicide	Acetanilide (Contact post emergence herbicide)			Selective	
Urea-based herbicide	Post (pre) emergence contact herbicide	Inhibition of amino acid synthesis		Broad Spectrum	

The list of insecticides for use is not exhaustive and it is intended that this list shall be reviewed from time to time. Persons handling pesticides shall take all necessary precautionary measures including the use of appropriate protective equipment anytime pesticides are handled.

LIST OF BANNED PESTICIDES

S/N O	PESTICIDES	RECOMMENDED NATIONAL IMPORT DECISIONS
1.	Heptachlor	Banned
2.	Flouroacedtamide	Banned
3.	Chlordane	Banned
4.	Mercury compounds	Banned
5.	Ethylene1.2-dibromide (EDB)	Banned
6.	Chlordimeform	Banned
7.	Dinoseb and Dinoseb salts	Banned
8.	Dichlorodiphenxyl trichloroethane (DDT)	Banned
9.	Pentachlorophenyl	Banned
10.	2,4,5-T	Banned
11.	Chlorobenizlate	Banned
12.	HCH (mixed isomers)	Banned
13.	Aldrin	Banned
14.	Dieldrin	Banned
15.	Methamidophos	Banned
16.	Methly Parathion	Banned
17.	Parathion	Banned
18.	Paraquat	Banned
19.	Lindane	Severe restriction
20.	Captafol	Severe restriction
21.	Hexachlorebanzene	Severe restriction
22.	Phosphamidon	Severe restriction

FEDERAL REPUBLIC OF NIGERIA

INSPECTION OF PEST AND VECTOR CONTROL OUTFIT

STATE-----

LOCAL GOVERNMENT AREA -----

WARD -----DISTRICT-----

TOWN-----VILLAGE----- STREET-----

TO
.....
.....

Your operational permit issued on the of 20..... to operate a Pest and Vector Control Outfit is hereby extended for the rest of the year.

Dated this day of 20.... at

.....
Chief Environmental Health Officer

.....
Head of Department

FEDERAL REPUBLIC OF NIGERIA

INSPECTION OF PEST AND VECTOR CONTROL OUTFIT

STATE-----

LOCAL GOVERNMENT AREA -----

WARD -----DISTRICT-----

TOWN-----VILLAGE----- STREET-----

TO.....

.....

.....

Please be informed that following the inspection of your equipment the following observations were made:

Working Conditions: Satisfactory/Not satisfactory

Safety standards: Appropriate/Not appropriate

* Please note that your continued operation shall constitute a violation of the law. You are advised to comply with the actions specified in the attached report and invite my office for another inspection on the actions taken.

Dated thisday of200.....

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Chief Environmental Health Officer

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Head of Department