# Country Situation Report on Highly Hazardous Pesticides (HHPs) in Uganda


**IPEN Toxics-free Sustainable Development Goals (SDGs)**

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## TABLE OF CONTENTS

## ABBREVIATIONS AND ACRONYMS

| | |
|---|---|
| **AU** | Africa Union |
| **AUPWAE** | Association of Uganda Professional Women in Agriculture and Environment |
| **BOU** | Bank of Uganda |
| **EPA** | Environmental Protection Agency |
| **EU** | European Union |
| **FIFRA** | Fungicide and Rodenticide Act |
| **GOU** | Government of Uganda |
| **HHPs** | Highly Hazardous Pesticides |
| **IPEN** | International Pollutants Elimination Network |
| **MAAIF** | Ministry of Agriculture, Animal Industry and Fisheries, Govt. of Uganda |
| **MWE** | Ministry of Water and Environment, Government of Uganda |
| **NAP** | National Agricultural Policy |
| **NDP** | National Development Plan |
| **NEMA** | National Environmental Management Authority |
| **NFP** | National Focal Point |
| **NIP** | National Implementation Plan |
| **PAN** | Pesticides Action Network |
| **POPs** | Persistent Organic Pollutants |
| **SAICM** | Strategic Approach to International Chemicals Management |
| **UBOS** | Uganda Bureau of Statistics |
| **UK** | United Kingdom |
| **UNACOH** | Uganda National Association of Community Occupational Health |
| **UNEP** | United Nations Environment Programme |

## LIST OF TABLES

**LIST OF FIGURES**

# 1. INTRODUCTION TO THE COUNTRY

## 1.1 General overview of the country and its agriculture activities

Uganda is a land locked country with an area of 241,500 km$^2$ lying astride the equator. It is located in the eastern region of Africa, situated at latitude 1º22'12.00" north and longitude 32º17'24.00" east. The country is bordered by South Sudan to the north, Kenya to the east, Tanzania and Rwanda to the south, and the Democratic Republic of the Congo to the west. Of the total area coverage of 241,500 sq. km, about 15.3% is open water, 3.0% permanent wetlands and 9.4% seasonal wetlands. The perimeter of Uganda is approximately 16,630 km.

The average annual temperature is about 26 degrees Celsius, with the rainy season being from March till May and October till November. The hydrology of the country is dominated by the drainage system of Lake Victoria, the largest freshwater lake in Africa, which has a surface area of about 68,800 km$^2$. The drainage basin of the Nile River, which is about 6,650 km long, covers eleven countries including Uganda, Tanzania, Rwanda, South Sudan, Republic of the Sudan, and Egypt, among others.

In Uganda agriculture has been and continues to be the most dominant and significant sector in regard to the country's economy. It remains central to economic growth and the enhancement of household incomes, thus it is the springboard for socio-economic transformation. More than 69% of the population derives their livelihoods from the sector. The agriculture, forestry and fisheries sector contributed 24.2% in total to GDP in the period 2017/18, according to national key economic indicators[1].

Processing of agricultural produce accounts for more than 40% of total manufacturing. The sector comprises food crops, cash crops, livestock, fisheries and agro-forestry production. With 14,169,000 hectares of arable land, Uganda has nearly 50% of the arable land in East Africa (https://futurepump.com/country-overview-uganda/) and is generally food secure and a reliable source of food for neighbouring countries that are often faced with food shortages. Compared to any other sector in the country, the sector supports millions of livelihoods, and it is mainly dominated by smallholder subsistence farmers represented by approximately 68% of agricultural households that are trapped in subsistence production. This demonstrates the importance of the agricultural sector to the poor, especially women, who dominate the sector.

In addition to the United Nations global 2030 Agenda for Sustainable Development, Uganda's Vision 2040 envisages a transformed Ugandan society from a peasant to a modern and prosperous country by the year 2040. For the realization of the vision, the country has identified agriculture as one of the five priority investment areas. The agriculture sector vision, as stated in the Government of Uganda - Ministry of Agriculture, Animal Industries and Fisheries' National Agriculture Policy (2013), aims at "a competitive, profitable and sustainable agricultural sector" that will be realized by transformation

[1] Uganda Bureau of Statistics https://www.ubos.org/explore-statistics/70/

from subsistence farming to commercial agriculture. The attainment of this long-term goal is hoped to deliver a number of outcomes, including: provision of food, income security and wealth creation, among others.

## 1.2 Main crops produced in the country

*Figure 1: Map of Uganda: Source Wikipedia*


Agriculture remains the backbone of the Ugandan economy. The agriculture sector is made up of crops, livestock and fisheries sub-sectors, with the crops subsector being key to agriculture development and industrialization for the country. According to the National Development Plan III, Uganda has prioritized the following commodities to foster a sustainable agro-industrialization agenda (because of their impact on exports earnings), namely: coffee, tea, fisheries, cotton, vegetable oil, beef by-products, maize and dairy. The doubling of fish, maize and dairy are also prioritized for nutrition and food security benefits. In addition, cassava was also selected because of its massive production, drought resistance, potential for multi-industrial use and food security.

On average, the agricultural sector registered improved growth rates in the years 2015 – 2019 (averaging 3.4 percent per annum). Notable improvements were especially observed in the food crops sub-sector (maize, cassava and bananas) that grew at an average of 3.7 percent. The cash crop sub-sector (coffee, cotton, tea) averaged growth rates of 6.4 percent. The increased production was a result of increased national budget allocation for the agriculture for that period to improve the sector[2].

However, the agricultural sector growth rate falls short of the 6.0 percent targeted under the national Vision 2040 of Uganda and the NDP II. For the first time in more than a decade, a reversal in the poverty levels in 2017 was documented, and was largely due to droughts and crop failures. With Uganda's agricultural production system covered by several agro-ecological zones, these zones are vulnerable to climate-related hazards such as droughts, storms, floods and related outbreaks of pests and diseases, which have aggravated the sector's deterioration and presented a direct linkage between poverty and meteorological patterns.

Also, historically, agricultural practices in Uganda consisted of crop rotation and intercropping, which put a check on pest populations. However, due to an increase in human population, limited land sizes for cultivation and a changing climate, such practices have been done away with, consequently leading to prevalence of pests and disease. To cope with this situation as well as increase agricultural

[2] https://futurepump.com/country-overview-uganda/

productivity and cultivation of quality products, large amounts of pesticides and other agrochemicals are increasingly being used.

**Table 1: Uganda's top 10 agricultural exports by shares of total exports (%), 2018**

| S/N | Commodity | % share of total exports |
|---|---|---|
| 1 | Coffee | 10.5 |
| 2 | Fish and fish products | 5.9 |
| 3 | Dairy | 3.4 |
| 4 | Horticulture | 2.6 |
| 5 | Tea | 2.2 |
| 6 | Cocoa | 1.9 |
| 7 | Maize | 1.7 |
| 8 | Cotton | 1.4 |
| 9 | Vegetable oil | 1.1 |
| 10 | Bananas | 0.2 |

*Source: BOU, UBOS (2019)*

Studies have nevertheless demonstrated that pesticides and agrochemicals continue to pose a risk to human health and the environment, resulting in chronic toxicity due to repeated or long-term exposure. Also of concern are the negative impacts of chemicals on the environment, for instance contamination of water resources and soils, and acute or chronic toxicity to non-target organisms that lead to disruption of ecosystem functions. Furthermore, misuse and overuse of the pesticides and agrochemicals may have reverse effects, further leading to reduction of agricultural production (e.g. due to increased pest resistance to pesticides or reduction of soil fertility) and poor sustainability of agricultural production in general[3].

## 1.3 National pesticide registration and control policy framework

Registration of pesticides (herbicides, insecticides, rodenticides, etc.) in Uganda is important in national efforts to control pests in crops and animals, so as to address yield losses and to control disease carrying vectors. Registration and proper application of pesticides is provided for in the national and regional legislative framework of the country, including the government's obligation to monitor the efficacy, toxicity and environmental effects of all pesticides.

[3]*According to Sekabojja et al (2020), acute pesticides poisoning is an on-going health challenge that requires prioritization, with organophosphate poisoning being the major cause of the poisonings. The majority of the poisonings were accidental poisonings, followed by self-harm and occupational poisonings. The pilot serves as a guide for the country to build a robust pesticide poisoning surveillance system and pesticide access control mechanisms from end user to treatment facilities.*

**The Constitution of Uganda (1995)** provides an overall framework for promoting sustainable development and the need to manage natural resources in a balanced and sustainable manner for the present and future generations. In particular, it makes provisions for the state to take all possible measures to prevent or minimize any destruction of land, air and water resources resulting from pollution or other causes.

**The Agricultural Chemicals (Control Act), 2006**, administered through an Agricultural Chemicals Board, provides the main policy framework for control and regulation, including registration of agricultural chemicals such as pesticides, fertilisers, growth regulators, wood preservatives, bio-pesticides, bio-fertilisers or any other chemicals used for promoting and protecting the health of plants.

**The National Environmental Act, 2019, Part VI: Sound Management of Chemicals and Product Control.** The Act makes provisions for: (a) Prohibition or restriction on import, export, manufacture, formulation, distribution and use of hazardous chemicals; (b) Management of hazardous chemicals and products containing hazardous chemicals; and (c) Registration of hazardous chemicals or products containing hazardous chemicals imported, exported, manufactured, packaged or used in Uganda; hazardous chemical substances or products containing hazardous chemicals declared as hazardous waste; and hazardous chemicals or products containing hazardous chemicals which may be progressively replaced by suitable alternatives.

**Political and legal support at regional and global level for agricultural pesticides registration:** In November 1999, the Treaty for the establishment of the East African Community (EAC) was signed by the heads of states of Kenya, Uganda and Tanzania. Article 108 on Plant and Animal Disease Control states: Partner states shall: a) Harmonize policies, legislation and regulation for enforcement of pest and disease control; b) Harmonize and strengthen regulatory institutions; c) Adopt common mechanism to ensure safety, efficacy and potency of agricultural inputs including chemicals, drugs and vaccines, among others.

Also, the **Guidelines on Data Requirements for the Registration of Conventional Chemical Pesticides used in Agriculture and Forestry in EAC Partner States, 2019** makes provisions for the registration of a pesticide regarding the data and studies that they should submit to national pesticide registration authorities. Furthermore, these more detailed guidelines state that national authorities require the same, or very similar, data from applicants, and thus harmonize the registration process across the EAC region.

## 1.4 Authorities responsible for the registration of pesticides, roles of different Ministries

**The Department of Crop Inspection and Certification at the Ministry of Agriculture, Animal Industry and Fisheries (MAAIF)** supports sustainable inspection and certification in Uganda, in conformity with national and international phytosanitary, seed/planting materials and agro-chemicals control requirements. The department, headed by a Commissioner, consists of three divisions; namely, the

Phytosanitary and Quarantine Inspection Services Division; the National Seed Certification Services Division; and the Agrochemicals Control Division.

**The Agricultural Chemicals Board**[4] is comprised of 10 members and 10 more ex-officio members, and is responsible for the registration and regulation of all use, import, export, distribution, and licensing of agriculture chemicals. The Board advises the Minister of Agriculture on applications for registration and licenses, on policies for safe use, storage and disposal of agricultural chemicals (including public awareness campaigns), and on enforcement of regulations. The Board has discretionary powers; for example, in granting specific producers a permit to import an unregistered pesticide for use on the farm only.

**The Agricultural Chemicals (Control Act), 2006** also confers powers on inspectors regarding monitoring and enforcing conformity with the Act and its regulations. Consequently, the role of the Board is guided by, among others, the third Strategic Objective of the Ministry of Agriculture, Animal Industry and Fisheries, which is "to strengthen and implement strategies, regulatory framework, standards, institutional structures and infrastructure for quality assurance and increased quantities of agricultural products to access and sustain local, regional and export markets."

*The overall functions of the Agricultural Chemicals Board are mandated as follows:*
- To ensure that agricultural chemicals are duly registered and used in a manner consistent with the labelling and in conformity with the regulations made under the Agricultural Chemicals Control Act;
- To regulate the quality and importation of agricultural chemicals into the country and their distribution;
- To consider applications for registration of agricultural chemicals, certified commercial applicators and fumigators, to issue licenses, and to make recommendations thereon to the Minister, who on the advice of the Board by statutory instrument appoint registrars to carry out the registration and issuing of licenses under the Agricultural Chemicals Control Act and any regulations made under it;
- To suspend, cancel or revoke a certificate of registration or license issued under the Agricultural Chemicals Control Act or any regulations made under it;
- To advise the Minister on all matters relating to and connected with the enforcement of the Agricultural Chemicals Control Act and any regulations made under it.

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**The National Drug Authority (NDA)** is responsible for the development and regulation of drugs and pharmacies nationwide and its board has representation comprising various government ministries, agencies and departments.

[4] *On the Board is representation from the Ministry; the dean of faculty of Agriculture, Ministry of Education; head of Agricultural Research; Government Chemist, Ministry of Internal Affairs; Veterinary Services from the Ministry of Agriculture; Director Medical Services; NEMA representative; Uganda National Bureau of Standards representative; Chief Forest Officer and a representative of the chemical industry.*

**The National Environment Management Authority of Uganda (NEMA)** is responsible for the nationwide coordination of environmental concerns with relevant ministries and agencies, as well as environmental policy planning and implementation, initiation/development of standards, guidelines, and legislation; environment impact assessment; public environment sensitisation and research; mobilisation, expedition and monitoring of resources for environmental management and stakeholder engagement.

### 1.5 International chemical conventions and agreements related to pesticides (Stockholm, Montreal Protocol, Rotterdam, SAICM), and the respective focal point or Designated National Authority

Uganda is party to regional and international agreements and protocols relating to usage and management of pesticides and other agrochemicals. These agreements and protocols are intended to, for example, phase out persistent organic pesticides and other chemicals (Stockholm Convention), as well as promote shared responsibility and cooperative efforts through prior informed consent in the international trade of certain hazardous chemicals in order to protect human health and the environment (Rotterdam Convention).

**The Stockholm Convention on Persistent Organic Pollutants (POPs)** is a global agreement that entered into force on 17th May 2004. The objective of the Convention is to protect human health and the environment from the adverse effects of POPs. Uganda ratified and acceded to the Convention on 20th July 2004, thereby agreeing to specific management and control of POPs.

**The Basel Convention on the Control of Transboundary Movements of Hazardous Wastes (1992)** aims at protecting human health and the environment from risks posed by hazardous wastes and their transboundary movement. The treaty was adopted in 1989, came into force in 1992, and Uganda acceded to it on 11th March 1999. The Convention addresses adverse effects which may result from the generation, transboundary movement and management of hazardous and other wastes.

**The Rotterdam Convention (2004)** was adopted in 1998 and entered into force in 2004. Uganda acceded to the Convention on 18 August 2008. The Convention promotes shared responsibility and cooperation among Parties in the international trade of certain hazardous chemicals in order to protect human health and the environment from potential harm; and facilitates information exchange and dissemination among Parties.

The Designated National Authority (DNA) for all the international conventions and other related multilateral environmental agreements in Uganda is Director of the National Environment Management Authority (NEMA), NEMA House, Plot 17/19/21 Jinja Road, PO. Box 22255 Kampala, Uganda; Telephone: 256-41-251064/5/8; Fax: 256-41-257521; Email: info@nemaug.org. The current Director (Focal Point) is Dr. Tom Okurut.

## 2. STATUS OF PESTICIDE USE IN THE COUNTRY

### 2.1 The list of nationally registered pesticides

This study reviewed the latest version of the government of Uganda Ministry of Agriculture Animal Industry and Fisheries (MAAIF) pesticide database (Agricultural Chemicals Register, 2020), which includes pesticide products registered between September 2016 and March 2020. At least 548 brand names were nationally registered as pesticides; the majority being insecticides, as shown below. In addition, the National Drug Register of Uganda-Veterinary Medicines, October 2020 was reviewed, with at least 26 acaricides identified for topical control of ectoparasites in livestock. An overview of these national chemical registers can be found in Appendices 1 and 2.

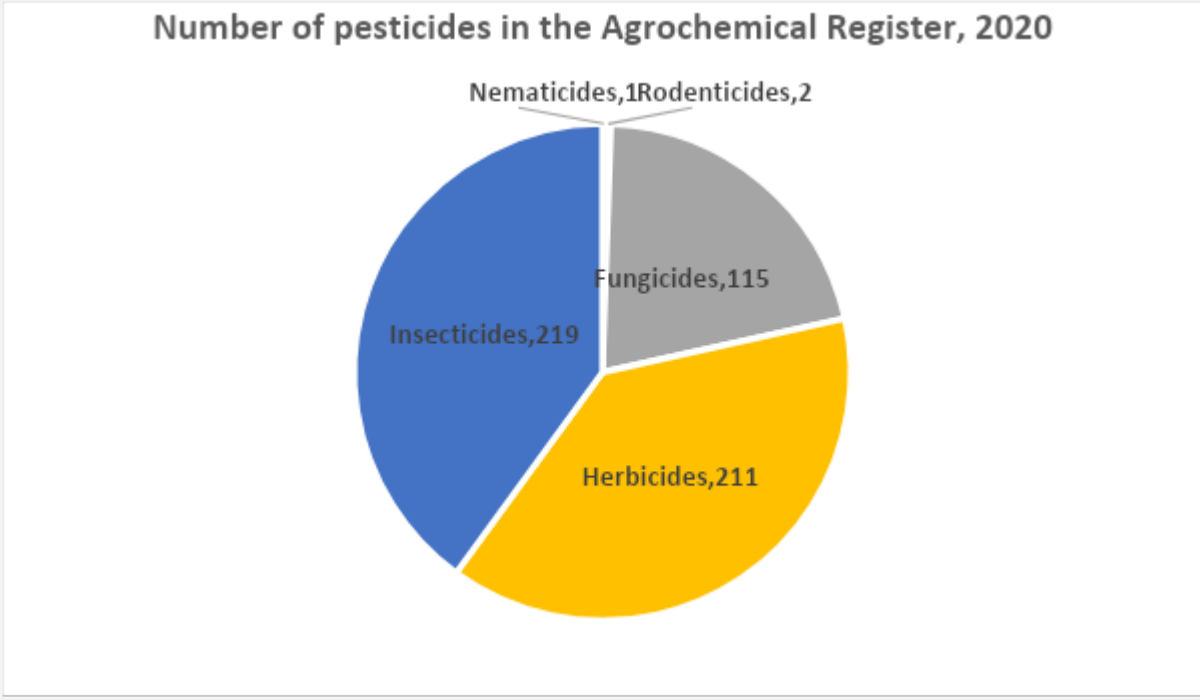



*Figure 2.1: Number of pesticides in the Agrochemicals Register (2020)*

### 2.2 The list of HHPs amongst the list of nationally registered pesticides

#### 2.2.1 Active ingredients

Guided by the set-out criteria and list of highly hazardous pesticides generated by Pesticide Action Network International (2018), this study reviewed the latest versions of the two main government agriculture-based (crop/livestock) pesticide databases (Agricultural Chemicals Register, March 2020; National Drug Register of Uganda-Veterinary Medicines, October 2020). At least 41 officially registered different active ingredients were identified as HHPs (Appendix 3), officially registered for at least 6 different uses. Slightly more than half (51.1%) of them were registered to control insect pests, with the rest registered for control of weeds, fungal diseases, ticks, nematodes and rodents.

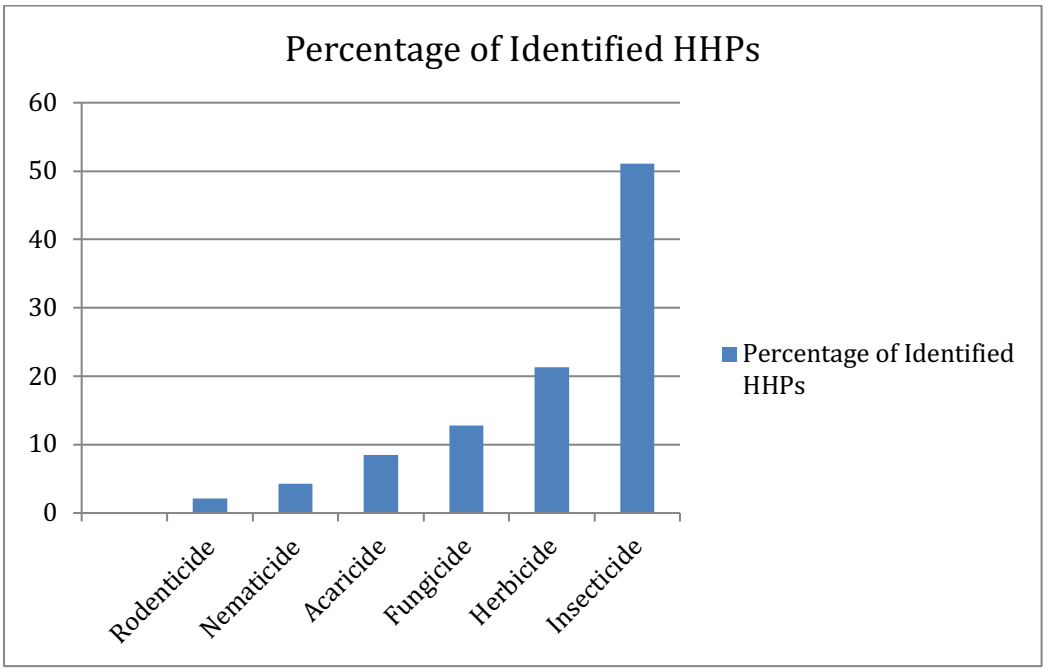



*Figure 2.2 Graph showing registered use of identified HHPs in Uganda*

### 2.2.2 Crops using HHPs

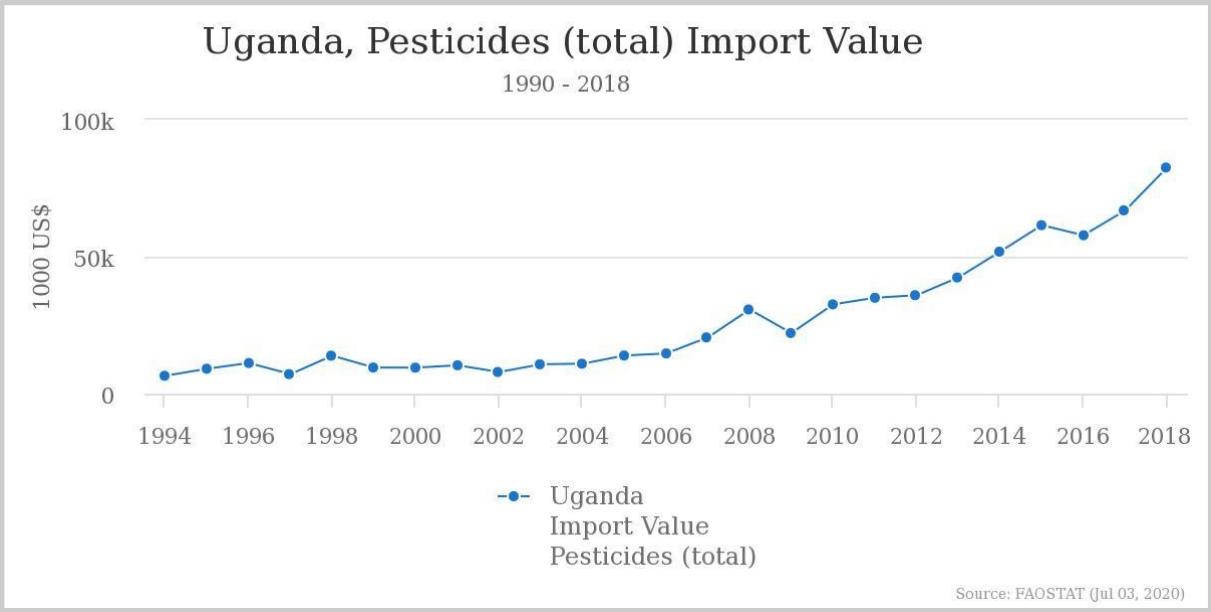
In November 2020, a rapid assessment was undertaken during training workshops organized by the Uganda National Association of Community and Occupational Health (UNACOH) for 325 farmers in eastern and central regions of Uganda. Farmers reported that they frequently (every season) apply pesticides on at least 10 different crops. The majority are horticultural crops (Appendix 4). In the eastern region (Kumi District), the most commonly sprayed crops were cotton, watermelon, citrus, maize, ground nuts and cow peas, with the most used HHPs active ingredients being Cypermethrin, Profenofos, Abamectin, Lambda-cyhalothrin, Thiamexotham, Dimethoate, Emamectin, and Dichlorvos.

In the central region (Sembabule District), the commonly used HHPs active ingredient was glyphosate, in the control of perennial weeds. In addition, the most sprayed crops were tomatoes, passion fruit, watermelon, cabbage, and coffee, using the HHPs active ingredients of Mancozeb, Abamectin, Carbendazim, Chlorpyrifos, Cypermethrin, Profenofos, Lambda-cyhalothrin, Thiamexotham, and Carbofuran.

## 2.3 General data on the volume of use of HHPs for agriculture

This study was unable to access specific reliable data on the volume of pesticides (and specifically for HHPs) used in Uganda's agriculture sector, owing to gaps in national documentation and reporting.

Nevertheless, in general, conservative estimates by the Food and Agriculture Organization of the United Nations (FAO) indicate that in terms of trade, Uganda's total pesticide import value increased by about 13 times, from US$6.5 to US$82.6 million, between 1994 and 2018 (FAO, 2020), as shown in the figure below. It is also worth noting that the Global Agricultural Outlook projections for 2018-2027 suggest the fastest increase in pesticide use, alongside continued growth in agricultural production, is in sub-Saharan Africa (OECD/FAO, 2018).




*Source: UN/FAO*

*Figure 2:3 Uganda Pesticides Total Import Value*

## 2.4 General data on the volume of use of HHPs for non-agriculture (household and public health) purposes

As mentioned, this study reviewed the latest versions of the Agricultural Chemicals Register (March 2020) and the National Drug Register of Uganda-Veterinary Medicines (October 2020). No other source provided information on the general volume of use of HHPs for non-agricultural purposes in Uganda at this stage.

## 2.5 List of HHPs banned in other countries but in use in Uganda

The global registration status of the 41 identified HHPs in Uganda is detailed in Appendix 3. Based on the European Commission Regulation No 1107/2009, more than half (59%) of the 41 HHPs identified under current official registration for use in Uganda are currently not approved for use across the European Union.

According to the U.S. Environmental Protection Agency (EPA), based on the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) as amended by Food Quality Protection Act (FQPA) of 1996, of the 41 HHPs currently registered in Uganda, the registration status of 83% of them is under review:

76% are under review to be registered, 7% are in the process of re-registration, 10% are not registered, and only 7% are currently officially registered in the United States of America. The U.S. EPA reviews each registered pesticide at least every 15 years to determine whether it continues to meet the FIFRA standard for registration, thus the registration status of such products whose review is ongoing is marked "Under review registration." In addition, EPA is re-evaluating all the pesticides registered before 1984, thus marked as "Under review_re-registration."

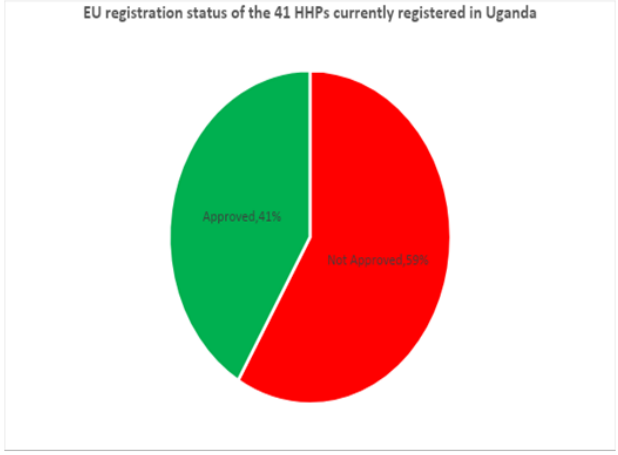



*Figure 2.4 EU Registration status of the 41 HHPs registered in UG*

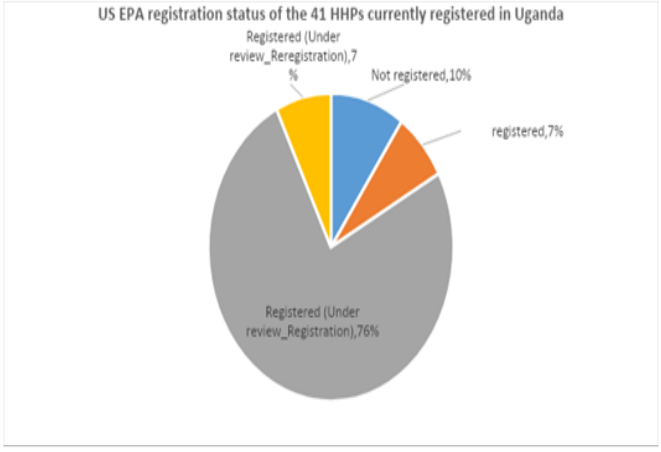



*Figure 2.5 US EPA Registration status of the 41 HHPs currently registered in Uganda*

## 2.6 Human health, environmental impacts or human rights issues related with HHPs in Uganda

As noted, exposure to pesticides is associated with short and long term human and environmental health effects. Acute pesticide poisoning is predominantly as a result of exposure to extremely and highly hazardous pesticides such as Dichlorvos, Carbofuran, Zinc Phosphide, Clofenvinphos, and Aldicarb, among others. Between 2005 and 2009, the United Nations Environment Program (UNEP) estimated the cost of injury due to pesticide poisoning in Sub-Saharan Africa to be about $6.3 billion (UNEP, 2013).

Although other commonly used pesticides in Uganda such as Mancozeb are not acutely toxic, they are associated with chronic effects including endocrine disruption, alteration of immune system response, developmental defects in children, and Parkinson's disease (Atuhaire et al., 2017). Evidence on elevated risk of mental illness (anxiety, depression, and mood disorders) among farm workers using pesticides has also been reported (Stallones & Beseler, 2016). In addition, other psychiatric symptoms such as fatigue, tension, confusion, sleep disturbances, and irritability have also been reported more frequently in exposed farm workers than in non-exposed farm workers (Cherry et al., 2012; Steenland et al., 2000).

Over the past years, there has been increased use of pesticides in developing countries (Cuenca et al., 2019; Oesterlund et al., 2014; Adekunle et al 2017; Damalas and Koutroubas 2017). This use is, however, associated with a high risk of pesticide exposure due to factors such as lack of proper user

training, unregulated access to highly hazardous pesticides, poor knowledge, limited use of recommended personal protective clothing, use of unsafe storage facilities, poor attitude towards risk and safety instructions, improper disposal of empty containers, and tank mixing different pesticides, among others (Atuhaire, 2017).

The majority of pesticide users in Uganda lack minimal training, thus fall short in having basic knowledge and skills to use these products (Diemer et al., 2020). This inadvertently results in gross misuse and handling of these toxic products, including minimal use of PPE (Oesterlund et al., 2014), (Sapbamrer & Thammachai, 2020), abusing mixing rates (Atuhaire et al., 2016, 2017a), non-adherence to recommended pre-harvest and re-entry periods (Atuhaire et al., 2016), improper storage in homes, irresponsible disposal of pesticide waste (Atuhaire, 2017), too frequent application, suicide and homicide (Pearson et al., 2017; Pedersen et al., 2017; Sekabojja et al., 2020; Sibani et al., 2017; Ssemugabo et al., 2017), and engaging children in pesticide trade and application (Atuhaire, 2017).

There is a lack of or limited data on how HHPs have negatively impacted the human and environmental health of Ugandans. However, there are increasing volumes of research and documentation studies on exposure to HHPs in Uganda. For instance, between 2013-2017, 393 cases of acute pesticide poisoning were registered by UNACOH in collaboration with local health facilities in the districts of Pallisa and Wakiso in Uganda (Sekabojja et al., 2020). In 2017, within the Pesticide Use in Tropical Settings Project (PESTROP), it was reported that the frequent use of the herbicide glyphosate may lead to neurobehavioral impairments and depression in applicators on smallholder farms in Uganda (Winkler et al., 2019).

Furthermore, environmental contamination with pesticides was reported through analysis of air samples in the country; for instance, the herbicide Atrazine and the insecticide Chlorpyrifos were present throughout the six months of the sampling campaign in Wakiso district, Uganda (Fuhrimann, Klánová, et al., 2020). Additionally, in 2018, through a country-wide assessment of tomato samples gathered from local farms and markets, UNACOH reported food contaminated with up to 7 different HHPs (Profenofos, Cypermethrin, Lambda-cyhalothrin, Dichlorvos, Chlorpyrifos, Malathion and Mancozeb), with notably high levels of Mancozeb.

UNACOH's assessment of up to 86 community drinking water sources across the country revealed environmental contamination with up to 25 different pesticides, of which the top five high residue concentrations were the HHPs Glyphosate, Dichlorvos, Atrazine, Aldicarb and Chlorfenvinphos (UNACOH, 2019). The aforementioned exposure puts not only the lives of the farmers at risk, but also those of their families, the general public and the environment. There has also been a recent focus at the global level on the right of individuals to scientific information in relation to hazardous pesticides, and developments on this will be followed.

## 2.7 The precautionary principle and national provisions to phase out HHPs, ban pesticides, and cancel or restrict the already-registered pesticides

The precautionary principle directs that action be taken to reduce risk from chemicals in the face of uncertain but suggestive evidence of harm, largely derived from the global Rio Declaration (1992) and the Wingspread Conference (1998) on implementing the Precautionary Principle. Under Article 245 of the 1995 Uganda Constitution, the government has a duty to protect and preserve the environment; hence, the central message remains in the Constitution that action should be taken to prevent harm to the environment and human health, even if scientific evidence is inconclusive. It permits a lower level of proof of harm to be used in policy-making whenever the consequences of waiting for higher levels of proof may be very costly or irreversible.

## 2.8 Companies and associations representing the pesticide industry in Uganda

The 41 identified HHPs in the 2020 Chemical Registers have been found to be imported and locally distributed by an estimated 39 local companies.

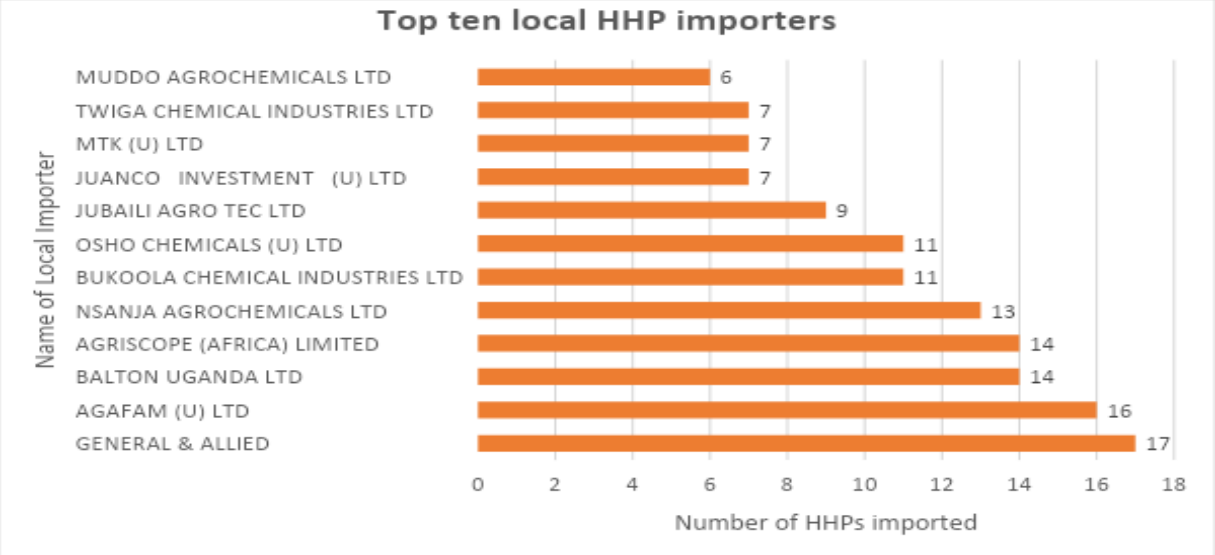



*Figure 2.6 Top ten local HHPs importers*

The broad-spectrum herbicide Glyphosate is the most imported of the 41 identified HHPs, by approximately 31/39 (79.5%) of the identified local importers. The top ten most imported HHPs are shown below.

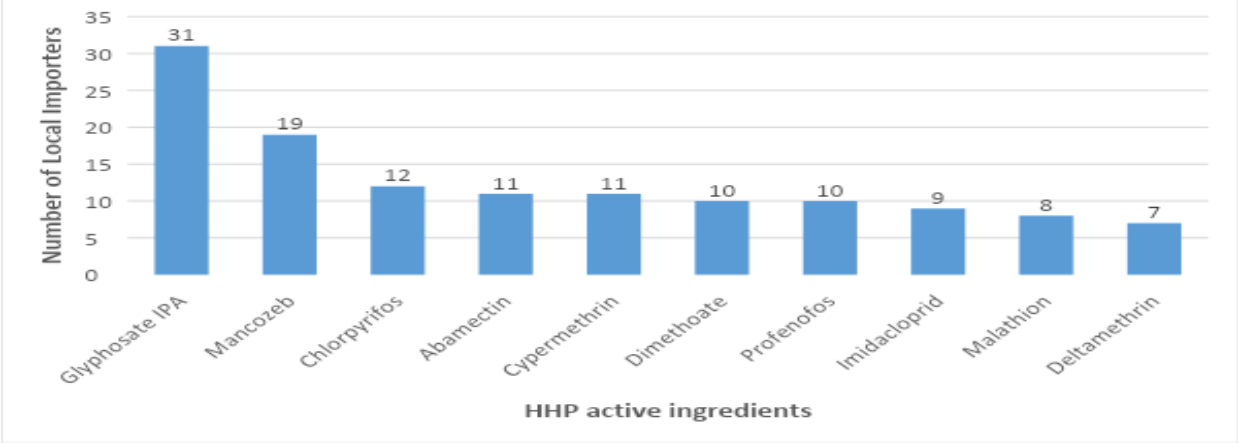



*Figure 2.7 Top ten HHPs imported into the country*

As shown in the figure below, at least twenty foreign countries were identified as sources of the currently used HHPs in Uganda, with China being the main source, serving 29/39 (74.4%) of Uganda's local distributors.

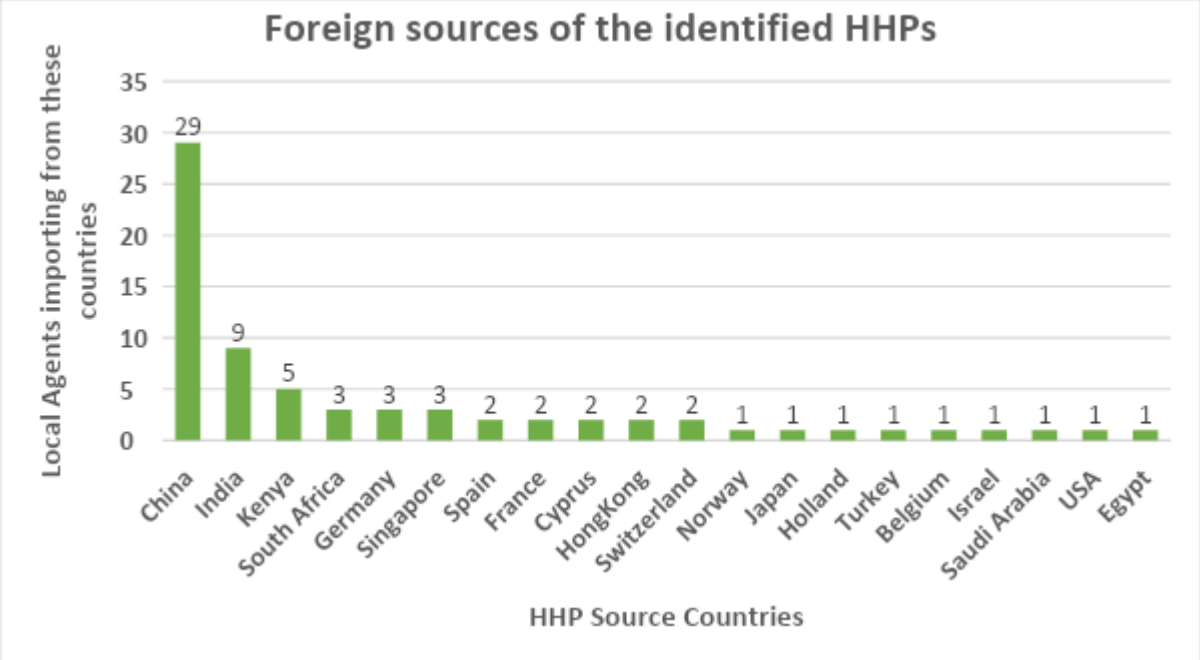



*Figure 2.8 Foreign sources of identified HHPs*

## 3. NATIONAL ENDEAVOURS TO PHASING OUT HHPs

### 3.1 Projects/programs and campaigns to phase out HHPs

Various challenges exist in relation to pesticide management in the agricultural sector in Uganda; for example, limited monitoring and reporting systems for health and environmental impacts of pesticides, including poisons information centres. Similarly, there have been challenges with porous borders and the need for more medical facilities to report, diagnose and treat cases of pesticide poisonings. In cases where highly hazardous pesticides continue to be used in agriculture, there may be a lack of knowledge about moderate alternatives, including information gaps related to the availability and distribution of biological alternatives and knowledge on their use.

For pesticide active ingredients listed by the Stockholm Convention, the National Environmental Management Authority Uganda conducted inventories throughout the country between November 2014 and April 2015. The key findings that came up regarding the management of POPs were:
(*a) POPs are not intentionally produced in Uganda; they are imported as pesticides and in articles mainly; (b) Major POPs imported into the country include Endosulfan pesticide with wide applications in agriculture against coffee borers and cotton bollworm for example.*

There was consequently a successful phase-out campaign of Endosulfan by NEMA, in which AUPWAE participated as an NGO, through awareness campaigns and development and implementation of a community-level communication strategy on POPs. The Strategy, aligned to Uganda's national-level Communication Strategy for POPs and a similar document for UNEP, ensured that AUPWAE effectively reached out to vegetable-farming communities and others vulnerable to POPs, with appropriate messages, using the most effective and available channels of communication, and carried out policy advocacy for hazardous pesticides on the various national and global-level platforms, including IPEN (which AUPWAE is a Participating Organization of).

Other activities implemented at the national level included successful enforcement and monitoring exercises for Endosulfan by the government of Uganda through NEMA and other stakeholders; and building national capacity to identify and assess sites contaminated by POPs.

In the case of DDT, it was reintroduced in Uganda in 2006 for continued malaria vector control with guidance from WHO and the Ministry of Health, under the exemption provided for in the Stockholm Convention COP8, Decision SC-8/2

**Additional initiatives and efforts, including projects and campaigns, to phase out HHPs are:**

*By government*

- The passing of the National Organic Agricultural Policy

*By Research Institutions*

- African Center of Excellence in Agro-ecology and Livelihood System (ACALISE), hosted by Uganda Martyrs University Nkozi, in partnership with RUFORUM and Regional Cassava Center,

funded by World Bank and IUCEA: the objective is popularization of sustainable climate smart agricultural systems

*Private Sector players*

- Holland GreenTech Uganda: promotes technologies that are environmentally friendly and pesticide alternatives (https://hollandgreentech.com/)
- Jacana Fruits- exports organic produce, thus promoting limited use of pesticides

National NGOs, CBOs and other civil society organizations are engaged in community sensitization, trainings, research, advocacy and participation in decision making. Additionally, multiple agriculture and environment initiatives are underway, including some about food and nutrition security.

### 3.2 Main challenges in the process of campaigning for the phasing out of HHPs

- Limited knowledge and low sensitization at community level on threats from and safety measures for pesticide application.
- Insufficient information and educational materials on hazardous pesticides that have been translated into existing local languages.
- Balancing organic principles with commercial imperatives; e.g. large scale farmers require significant quantities of agricultural chemicals. In these instances, the use of non-chemical alternatives may not necessarily be economically sustainable.
- Similarly, ecological practices for organic agriculture are largely labour intensive and time consuming.
- Limited access to products for organic farming.
- Counterfeits and fake agro-chemicals are available at cheap prices.
- Lack of clarity of the policy, laws and regulations for addressing HHPs.
- Lack of funding and self-financing to support phasing out of HHPs and promoting/ advocating for the use of less or non-hazardous pesticides.
- Insufficient policy support and tools for phasing out HHPs in Uganda. Therefore, opportunity exists for non-governmental organisations such as AUPWAE and partners to engage in advocacy and knowledge-sharing in order to put HHPs on the national policy agenda.

## 3.3 Recommendations and project ideas that support the national HHPs phase out

I. Organize proactive awareness campaigns on HHPs with information on health, economic and environmental impacts and targeting government, pesticides regulators/ users, NGOs, representatives of development agencies, media and the general public.
II. Open a national consultation of stakeholders on the current list of HHPs for adoption and continued review. Through the IPEN/AUPWAE project, a community of practice on HHPs in Uganda was established and networks strengthened with farmers, CSOs, NEMA, MAAIF and other government bodies.
III. Develop a national strategy for the gradual phase-out of highly hazardous pesticides in Uganda.
IV. Promote markets for organic products to promote health, and environmental and economic benefits.

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## APPENDICES

## Appendix 1: Agricultural Chemicals Register (As of March, 2020)

**REPUBLIC OF UGANDA**

**MINISTRY OF AGRICULTURE ANIMAL INDUSTRY AND FISHERIES**

### REGISTER OF AGRICULTURAL CHEMICALS REGISTERED

### UNDER SECTION 4 OF THE AGRICULTURAL CHEMICALS (CONTROL) ACT, 2006 AS AT 27TH MARCH, 2020

| PERIOD OF REGISTRATION | THE REGISTRATION NUMBER | TRADE NAME/COMMERCIAL NAME | NAME OF ACTIVE INGREDIENT (S) AND CONCENTRATION | NAME OF THE REGISTRANT | LOCAL AGENT/DISTRIBUTOR |
|---|---|---|---|---|---|
| 27/3/2020 | UgC/2020/002329/Fu/RR | ROVER 72WP | Cymoxanil 80g/kg + Mancozeb 640g/kg | WILLOWOOD LIMITED HONGKONG, CHINA | AGRISCOPE (AFRICA) LIMITED |
| 27/3/2020 | UgC/2020/002328/In/RR | DYNAMO 1.9EC | Emamectin benzoate 19g/l | WILLOWOOD LIMITED HONGKONG, CHINA | AGRISCOPE (AFRICA) LIMITED |
| 27/3/2020 | UgC/2020/002327/In/RR | CYCHLOR 55EC | Chlorpyrifos 500g/l + Cypermethrin 50g/l | WILLOWOOD LIMITED HONGKONG, CHINA | AGRISCOPE (AFRICA) LIMITED |
| 17/3/2020 | UgC/2020/002326/In/RRR | SUMITHION 50EC | Fenitrothion 500g/l | SUMITOMO CORPORATION, JAPAN | TWIGA CHEMICAL INDUSTRIES LTD |
| 17/3/2020 | UgC/2020/002325/He/RRRR | TWIGA 2,4-D AMINE 72SL | 2,4-D Amine Salt 720g/l | ATUL LTD, AGROCHEM DIVISION, INDIA | TWIGA CHEMICAL INDUSTRIES LTD |

| | | | | | |
|---|---|---|---|---|---|
| 17/3/2020 | UgC/2020/002324/In/RRRR | TWIGA LACE 100EC | Lambdacyhalothrin 60g/l + Acetamipirid 40g/l | VOLCANO AGRO SCIENCE (PTY) COMPANY LTD, SA | TWIGA CHEMICAL INDUSTRIES LTD |
| 17/3/2020 | UgC/2020/002323/He/RRR | TWIGA GLYPHOSATE 360SL | Glyphosate 360g/l | VOLCANO AGRO SCIENCE (PTY) COMPANY LTD, SA | TWIGA CHEMICAL INDUSTRIES LTD |
| 17/3/2020 | UgC/2020/002322/In/RR | BRAVO 20SL | Imidacloprid 200g/l | ZAGRO SINGAPORE PTE LTD | ZAGRO (U) LTD- 0751077081 |
| 17/3/2020 | UgC/2020/002321/Fu/RRR | VICTORY 72WP | Metalaxyl 80g/kg + Mancozeb 640g/kg | INVECTRA AGRO LTD, CYPRUS | BALTON (U) LTD |
| 17/3/2020 | UgC/2020/002320/Fu/RRR | MILOR 72WP | Metalaxyl 80g/kg + Mancozeb 640g/kg | ROTAM AGRO-CHEM LTD, HONG KONG | MTK (U) LTD |
| 17/3/2020 | UgC/2020/002319/In/RRRRR | JACKPOT 50EC | Lambdacyhalothrin 50g/l | ROTAM AGRO-CHEM LTD, HONG KONG | MTK (U) LTD |
| 17/3/2020 | UgC/2020/002318/Fu/RRRRR | VOLAR 690WP | Dimetormorph 90g/kg + Mancozeb 600g/kg | ROTAM AGRO-CHEM LTD, HONG KONG | MTK (U) LTD |
| 13/3/2020 | UgC/2020/002317/Fu/RRR | RODAZIM 500SC | Carbendazim 500g/l | ROTAM AGRO-CHEM LTD, HONG KONG | MTK (U) LTD |
| 13/3/2020 | UgC/2020/002316/In/RR | MAXIMUM 200SC | Imidacloprid 200g/l | FORWARD SHANGHAI, CHINA | MTK (U) LTD |
| 13/3/2020 | UgC/2020/002315/Fu/RR | SUPAZIM 500SC | Carbendazim 500g/l | FORWARD SHANGHAI, CHINA | MTK (U) LTD |
| 13/3/2020 | UgC/2020/002314/He/RRRR | NO WEED 36SL | Glyphosate 360g/l | FORWARD SHANGHAI, CHINA | MTK (U) LTD |
| 13/3/2020 | UgC/2020/002313/BCA/R | CRYPTEX | Thaumatotibia leucotreta granulovirus (Crle Gv) $2X10^{10}$ OBs/ml | MADUMBI SUSTAINABLE AGRICULTURE (PTY) LTD, SA | JAMBO ROSES |
| 13/3/2020 | UgC/2020/002312/BCA/R | ECO-Bb | Beaveria bassiana $2x10^{9}$ CFU/g | MADUMBI SUSTAINABLE AGRICULTURE (PTY) LTD | JAMBO ROSES |
| 11/3/2020 | UgC/2020/002311/In/RRR | SICOTHOATE 40EC | Dimethoate 400g/l | SINOCHEM SHANGAI Co LTD CHINA | AGRISCOPE AFRICA LTD |
| 11/3/2020 | UgC/2020/002310/He/RRRR | ASCOMINE 72SL | 2,4 D amine 720g/l | HANGZHOU YILONG CHEMICAL INDUSTRIES CHINA | AGRISCOPE AFRICA LTD |

***Section of the register***

## Appendix 2: Uganda National Drug Register Veterinary Medicines (October, 2020)

| S/N | NDA REGISTRATION NUMBER | LICENSE HOLDER | LOCAL TECHNICAL REPRESENTATIVE | NAME OF DRUG | GENERIC NAME OF DRUG | STRENGTH OF DRUG | MANUFACTURER | COUNTRY OF MANUFACTURE | DOSAGE FORM | PACK SIZE | REGISTRATION DATE |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | NDA/MAL/VDP/1536 | NORBROOK KENYA LTD | NORBROOK (U) LTD | LEVAFAS X-TRA | LEVAMISOLE +OXYCLOZANIDE | 7.5% W/V +15% W/V | NORBROOK KENYA LTD-OLD KIMURU RD- KARURI | KENYA | ORAL LIQUID ORDINARY SUSPENSIONS | 1.0X5.0 L JERRYCAN,1.0X40.0 ML BOTTLE,1.0X125.0 ML BOTTLE,1.0X500.0 ML BOTTLE,1.0X1.0 L JERRYCAN | 7/1/2014 |
| 2 | NDA/MAL/VDP/1594 | NORBROOK KENYA LTD | NORBROOK (U) LTD | PESTIGON | FIPRONIL | 100MG | NORBROOK LABORATORIES LTD-STATION WORKS, NEWRY, COUNTRY DOWN, BT35 6JP, NORTHERN IRELAND-UK | UNITED KINGDOM | TOPICAL EXTERNAL LIQUIDS | 1.0X4.02 ML PIPETTE,1.0X1.34 ML PIPETTE,1.0X0.67 ML PIPETTE,1.0X0.5 ML PIPETTE,1.0X2.68 ML PIPETTE | 7/1/2013 |
| 3 | NDA/MAL/VDP/1617 | HEBEI YUANZHENG PHARMACEUTICAL CO LTD | EVERVICTORY LIMITED | EVACIDE | OXYCLOZANIDE + LEVAMISOLE HYDROCHLORIDE | 30MG + 15MG /ML | HEBEI YUANZHENG PHARMACEUTICAL CO., LTD - INDUSTRIAL AREA, YUANSHI COUNTY, SHIJIAZHUANG CITY, HEBEI PROVINCE | CHINA | ORAL LIQUID ORDINARY SUSPENSIONS | 1.0X500.0 ML CONTAINER,1.0X100.0 ML CONTAINER,1.0X1.0 L CONTAINER | 7/1/2013 |
| 4 | NDA/MAL/VDP/1621 | HEBEI YUANZHENG PHARMACEUTICAL CO LTD | EVERVICTORY LIMITED | IVERMECTIN | IVERMECTIN | 1%W/V | HEBEI YUANZHENG PHARMACEUTICAL CO LTD--NO.16 LIUYUAN ROAD,CHANG'AN DISTRICT SHIJIAZHUANG CITY HEBEI PROVINCE | CHINA | PARENTERAL ORDINARY SC VIALS | 1.0X100.0 ML VIAL,1.0X50.0 ML VIAL | 7/1/2013 |
| 5 | NDA/MAL/VDP/1644 | HEBEI YUANZHENG PHARMACEUTICAL CO LTD | EVERVICTORY LIMITED | DIMINAZENE PLUS | DIMINAZENE DIACETURATE + ANTIPYRINE + VITAMIN B12 | 1.05G + 1.31G +1MG/ 2.36G | HEBEI YUANZHENG PHARMACEUTICAL CO LTD--NO.16 LIUYUAN ROAD,CHANG'AN DISTRICT SHIJIAZHUANG CITY HEBEI PROVINCE | CHINA | OTHER SYSTEMIC POWDER | 1.0X23.6 G SACHET,1.0X2.36 G SACHET | 7/1/2014 |

***Section of the Register which contains 323 drugs***

**Appendix 3: List of HHP active ingredients among the currently approved pesticides in Uganda (as extracted from lists in Appendices 1 & 2)**

| S/N | Currently Registered for use in Uganda | | Current Global Registration Status | |
|---|---|---|---|---|
| | **Active Ingredient Name** | **Registered Use (Farmer reported use)** | **EU (EC Regulation 1107)** | **US EPA** |
| 1 | Abamectin | Insecticide | Approved | Registered (Under review_Registration) |
| 2 | Alpha-Cypermethrin | Insecticide | Approved | Registered |
| 3 | Atrazine | Herbicide | Not Approved | Registered (Under review_Registration) |
| 4 | Butachlor | Herbicide | Not Approved | Not Registered |
| 5 | Carbendazim | Fungicide | Not Approved | Registered (Under review_Registration) |
| 6 | Carbofuran | Insecticide | Not Approved | Registered (Under review_Registration) |
| 7 | Carbosulfan | Insecticide | Not Approved | Not Registered |
| 8 | Chlorfenvinphos | Acaricide | Not Approved | Not Registered |
| 9 | Chlorothalonil | Fungicide | Not Approved | Registered (Under review_Registration) |
| 10 | Chlorpyrifos | Insecticide | Not Approved | Registered (Under review_Registration) |
| 11 | Cypermethrin | Insecticide | Approved | Registered (Under review_Registration) |
| 12 | Deltamethrin | Insecticide | Approved | Registered (Under review_Registration) |
| 13 | Dichlorvos (DDVP) | Insecticide | Not Approved | Registered (Under review_Registration) |
| 14 | Dimethoate | Insecticide | Not Approved | Registered (Under review_Registration) |
| 15 | Emamectin benzoate | Insecticide | Approved | Registered (Under review_Registration) |

| | | | | |
|---|---|---|---|---|
| 16 | Fenitrothion | Insecticide | Not Approved | Registered (Under review_Registration) |
| 17 | Fenvalerate | Insecticide | Not Approved | Registered (Under review_Registration) |
| 18 | Fipronil | insecticide/Acaricide | Not Approved | Registered (Under review_Registration) |
| 19 | Glyphosate IPA | Herbicide (Couch grass, Black jack) | Approved | Registered |
| 20 | Imidacloprid | Insecticide | Approved | Registered (Under review_Registration) |
| 21 | Lambda-cyhalothrin | Insecticide | Approved | Registered (Under review_Registration) |
| 22 | Malathion | Insecticide | Approved | Registered (Under review_Registration) |
| 23 | Mancozeb | Fungicide | Approved | Registered (Under review_Reregistration) |
| 24 | Maneb | Fungicide | Not Approved | Registered (Under review_Registration) |
| 25 | Permethrin | Insecticide | Not Approved | Registered (Under review_Registration) |
| 26 | Pirimiphos-methyl | Insecticide | Approved | Registered (Under review_Registration) |
| 27 | Profenofos | Insecticide | Not Approved | Registered (Under review_Registration) |
| 28 | Thiamethoxam | Insecticide | Not Approved | Registered (Under review_Registration) |
| 29 | Zinc phosphide | Rodenticide | Approved | Registered (Under review_Reregistration) |
| 30 | Diuron | Herbicide | Not Approved | Registered (Under review_Reregistration) |
| 31 | Fenamiphos | Nematicide | Not Approved | Registered (Under review_Registration) |
| 32 | Metribuzin | Herbicide | Approved | Registered (Under review_Registration) |

| | | | | |
|---|---|---|---|---|
| 33 | Pendimethalin | Herbicide | Approved | Registered (Under review_Registration) |
| 34 | Lufenuron | Insecticide | Not Approved | Registered |
| 35 | Indoxacarb | Insecticide | Approved | Registered (Under review_Registration) |
| 36 | Glufosinate Ammonium | Herbicide | Not Approved | Registered (Under review_Registration) |
| 37 | Oxadiazon | Herbicide | Not Approved | Registered (Under review_Registration) |
| 38 | Zeta-Cypermethrin | Insecticide | Approved | Not Registered |
| 39 | Bifenthrin | Insecticide | Not Approved | Registered (Under review_Registration) |
| 40 | Oxyfluorfen | Herbicide | Approved | Registered (Under review_Registration) |
| 41 | Thiophanate-methyl | Fungicide | Not Approved | Registered (Under review_Registration) |

**Appendix 4: Crops using the identified HHPs**

| S/N | Registered for use in Uganda | | Used by interviewed farmers in Kumi, Sembabule | | |
|---|---|---|---|---|---|
| | **Active Ingredient Name** | **Registered Use** | **Common Brand names** | **Crop** | **Pest/Disease** |
| 1 | Abamectin | Insecticide | Afri-Acelamectin, Dudu Acelamectin, Mectin, Flazon, Punch, Sta, Dynamec, Sukuprid, Ocelamectin, Supa Acelamectin, Amdocs | Tomato, watermelon, cabbage, passion fruit | Mites, stink bugs, aphids, flies, bollworms |
| 2 | Alpha-Cypermethrin | Insecticide | Alpha, Fastac, Alphakill, Cypermex, Fendona | | |
| 3 | Atrazine | Herbicide | Megazine, Atra, Primagram Gold, Metrazine, Maize Succeed | | Weeds |
| 4 | Bifenthrin | Insecticide | Brigade | | |
| 5 | Butachlor | Herbicide | Butanil, Butaforce, Supanil | | |
| 6 | Carbendazim | Fungicide | Rodazim, Pearl, Agrozim, Superzim, Tornado, Rapid | Tomato | Septoria leaf spot |
| 6 | Carbofuran | Insecticide | Safuran, Furon, Wormforce, Agro-Furan, Furadan | Banana, birds | Nematodes, birds |
| 7 | Carbosulfan | Insecticide | Dudu Guard, Marshal | Banana | |

| | | | | | |
|---|---|---|---|---|---|
| 8 | Chlorfenvinphos | Acaricide | Protaid, Supona Extra | Cattle | Ticks |
| 9 | Chlorothalonil | Fungicide | Banko, Cleaner, Daconil | | |
| 10 | Chlorpyrifos | Insecticide/Acaricide | Dursban, Fimbo, Ant-Killer, Ascoris, Tricel, No Worry, Terminator, Duodip | Passion fruit, bananas, cattle | Weevils, ticks |
| 11 | Cypermethrin | Insecticide | Dudu Cyper, Cyperlacer, Cyperforce, Cypex, Ralothrin, Profex Super, Extreme, Misile, Larvet, Cypercal, Socket Plus, Profecron, Roket | Tomato, cotton, citrus,…. | Aphids, stink bug, bollworms |
| 12 | Deltamethrin | Insecticide | Decis, Atom, Keshet, Delete, Tridelta | | |
| 13 | Dichlorvos (DDVP) | Insecticide | Lava, Ddforce, Fumex, Vapo, Boom Super, Dichlobex | Cabbage, maize, indoors | |
| 14 | Dimethoate | Insecticide | Dudu Ethoate, Tafgor, Dimeforce, Twigathoate, Ogor | Beans, tomatoes | |
| 30 | Diuron | Herbicide | Viron, Agron, Sugcane | | |
| 15 | Emamectin benzoate | Insecticide | Eminent, Amdocs, Target, Dynamo, Caterpillat Force, Mamectin, Porselen, Proclaim Fit | Cotton, maize | |
| 31 | Fenamiphos | Nematicide | Nemakill | | |
| 16 | Fenitrothion | Insecticide | Shumba Super, Sumithion | | |

| | | | | | |
|---|---|---|---|---|---|
| 17 | Fenvalerate | Insecticide | Fenvalerate | | |
| 18 | Fipronil | insecticide/Acaricide | Termidor, Goliath Gel | | Termites |
| 36 | Glufosinate Ammonium | Herbicide | Bastnate, Trast | | |
| 19 | Glyphosate IPA | Herbicide | Weedmaster, Jembe, Force Up, Weed Solution, Round Up….(60+) | | Weeds |
| 20 | Imidacloprid | Insecticide | Bravo, Confidor, Imitrust, Pronto, Gaucho, Kohinor, Twins | | |
| 35 | Indoxacarb | Insecticide | Fighter, Benocarb | | |
| 21 | Lambda-cyhalothrin | Insecticide | Lara Force, Lambdex, Umeme Top, Jackpot, Judo Plus, Mambda, Agro-Lambda, Fortforce, Striker, Bash, Select Plus | Cotton ,maize, citrus | Coffee twig borer, fruit fly, leafminer, aphids, glow fly, green stink bug, army worm, boll worm |
| 34 | Lufenuron | Insecticide | Emmaron | | |
| 22 | Malathion | Insecticide | Malataf, Oshothion, Dera Blue Cross, Agro-Malon, Aviguard, Magic | tomato, | |
| 23 | Mancozeb | Fungicide | Indofil, Dithane, Oshothane, Sicozeb, Emthane, Mistress, Fangocil, Ridomil, Kingmill, Secret | Tomato, Passion fruit, water melon, beans | Blight |
| 24 | Maneb | Fungicide | Topilite | Tomato | Septoria leaf spot |

| | | | | | |
|---|---|---|---|---|---|
| 32 | Metribuzin | Herbicide | Metrix, Jaguar, Unimark | | |
| 37 | Oxadiazon | Herbicide | Ronstar | | |
| 40 | Oxyfluorfen | Herbicide | Onionfen | | |
| 33 | Pendimethalin | Herbicide | Stomp, Ktomp, Ceding, Agro-Stump | | |
| 25 | Permethrin | Insecticide | Dragnet, Ambush, Actellic Super, Superguard, Agrillic Super, Agro-Dellic Grain Dust | Maize, cabbage, tomato | Variety of insect pests |
| 26 | Pirimiphos-methyl | Insecticide | Actellic Super, Superguard, Agrillic Super, Agro-Dellic Grain Dust | | |
| 27 | Profenofos | Insecticide | Roket, Top Cure, Hitcell, Topfenos, Select Plus, Profex Super, Extreme<br>Misile, Larvet, Cypercal, Socket Plus, Profecron, | Cotton, tomatoes, maize, cabbage, eggplant | Aphids, bollworm, green stink bug, army worm, leaf perforators |
| 28 | Thiamethoxam | Insecticide | Fezidol, Actara, Spike ,Cruiser, Kerlan, Striker, Bash, Engeo | | Coffee twig borer, fruit fly, aphids, stink bug, butterflies, bollworms |
| 41 | Thiophanate-methyl | Fungicide | Control, Topilite | Tomatoes | Septoria leaf spot |
| 38 | Zeta-Cypermethrin | Insecticide | Fury | | |
| 29 | Zinc phosphide | Rodenticide | | Public health (indoors) | Rodents |

**Appendix 5: HHP local distributing agents and countries of source**

| S/N | Name of Local Agent/Distributor in Uganda | HHP Source Country | Names of HHPs Distributed |
|---|---|---|---|
| 1 | GENERAL & ALLIED | India, Singapore | Abamectin, Alpha-Cypermethrin, Carbendazim, Carbofuran, Chlorpyrifos, Cypermethrin, Deltamethrin, Dimethoate, Diuron, Emamectin, Glyphosate, Lambda-Cyhalothrin, Malathion, Mancozeb, Pendimethalin, Pirimiphos-methyl, Profenofos |
| 2 | AGAFAM (U) LTD | Germany, China, South Africa, Turkey | Abamectin, Alpha-cypermethrin, Chlorothalonil, Cypermethrin, Deltamethrin, Emamectin, Fipronil, Glufosinate Ammonium, Glyphosate, Imidacloprid, Indoxacarb, Lufenuron, Malathion, Mancozeb, Pendimethalin, Pirimiphos-methyl |
| 3 | BALTON UGANDA LTD | Cyprus, Holland, Belgium, China, Switzerland, Kenya, Germany, Norway, France, Israel | Abamectin, Atrazine, Chlorpyrifos, Cypermethrin, Deltamethrin, Dichlorvos, Glyphosate, Imidacloprid, Lambda-cyhalothrin, Mancozeb, Metribuzin, Pendimethalin, Profenofos, Thiamexotham |
| 4 | AGRISCOPE (AFRICA) LIMITED | China, India, Cyprus, Hong Kong | Carbendazim, Chlorpyrifos, Cypermethrin, Deltamethrin, Dimethoate, Diuron, Emamectin, Glyphosate, Indoxacarb, Malathion, Mancozeb, Pirimiphos-methyl, Metribuzin, Profenofos |
| 5 | NSANJA AGROCHEMICALS LTD | China, India, France | Atrazine, Carbofuran, Chlorpyrifos, Cypermethrin, Dichlorvos, Dimethoate, Diuron, Fenvalerate, Glyphosate, Malathion, Mancozeb, Oxyfluorfen, Profenos |

| | | | |
|---|---|---|---|
| 6 | BUKOOLA CHEMICAL INDUSTRIES LTD | India, China | Abamectin, Atrazine, Butachlor, Carbosulfan, Chlorpyrifos, Cypermethrin, Glyphosate, Imidacloprid, Mancozeb, Maneb, Thiamexotham |
| 7 | OSHO CHEMICALS (U) LTD | Kenya | Alpha-cypermethrin, Carbendazim, Chlorpyrifos, Deltamethrin, Dimethoate, Glyphosate, Imidacloprid, Lambda-cyhalothrin, Malathion, Mancozeb, Thiophanate-methyl |
| 8 | JUBAILI AGRO TEC LTD | China, Saudi Arabia, India | Abamectin, Cypermethrin, Dimethoate, Emamectin, Glyphosate, Imidacloprid, Lambda-cyhalothrin, Malathion, Mancozeb |
| 9 | JUANCO INVESTMENT (U) LTD | Kenya, Switzerland, USA | Alpha-cypermethrin, Bifenthrin, Carbosulfan, Glyphosate, Mancozeb, Permethrin, Zeta-Cypermethrin |
| 10 | MTK (U) LTD | Hong Kong, China | Carbendazim, Glyphosate, Imidacloprid, Lambda-cyhalothrin, Mancozeb, Profenofos, Thiamexotham |
| 11 | TWIGA CHEMICAL INDUSTRIES LTD | Japan, India, South Africa, Kenya, Egypt | Chlorpyrifos, Dimethoate, Fenitrothion, Glyphosate, Lambda-cyhalothrin, Pirimiphos-methyl, Profenofos |
| 12 | MUDDO AGROCHEMICALS LTD | China | Abamectin, Chlorpyrifos, Dimethoate, Glyphosate, Malathion, Mancozeb |
| 13 | ZAGRO UGANDA LTD | Singapore | Chlorpyrifos, Glufosinate Ammonium, Imidacloprid, Pendimethalin, Thiamexotham |
| 14 | BAYER EAST AFRICA | Germany | Abamectin, Deltamethrin, Imidacloprid, Oxadiazon |

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|---|---|---|---|
| 15 | HANGZHOU | China | Atrazine, Fenamiphos, Glyphosate, Pendimethalin |
| 16 | AGROHAO (U) LTD, KAMPALA | China | Butachlor, Chlorpyrifos, Dimethoate, Glyphosate |
| 17 | HOME HARVEST (U) LTD | Singapore, South Africa | Cypermethrin, Dimethoate, Glyphosate, Mancozeb |
| 18 | SUKUMA (U) LTD | China | Abamectin, Glyphosate, Mancozeb |
| 19 | SEKALALA | China | Chlorpyrifos, Glyphosate, Mancozeb |
| 20 | CHANGZHOU EASTCHEM INTERNATIONAL Co. LTD, CHINA | China | Cypermethrin, Dichlorvos, Dimethoate |
| 21 | KUUTO GENERAL STORES | China | Cypermethrin, Glyphosate, Mancozeb |
| 22 | GLOBAL AGRO-INPUT LIMITED | China | Glyphosate, Mancozeb, Imidacloprid |
| 23 | KEITH ASSOCIATES LTD | China | Glyphosate, Mancozeb, Pendimethalin |
| 24 | KYEBE GENERAL ENTERPRISES LTD | China | Glyphosate, Malathion, Profenofos |
| 25 | SUPA SEEDS AFRICA LTD | China | Dichlorvos, Glyphosate, Profenofos |
| 26 | TRUST CHEMICALS (U) LTD | China, India, Spain | Glyphosate, Mancozeb, Profenofos |
| 27 | AFRICA ONE | China | Glyphosate, Abamectin |

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|---|---|---|---|
| 28 | EXPORT TRADING COMPANY | China | Abamectin, Profenofos |
| 29 | KILIMO FIELD MASTER CO. LTD, KAMPALA | China | Chlorpyrifos, Cypermethrin |
| 30 | EVER GREEN INTERNATIONAL | China | Glyphosate, Mancozeb |
| 31 | AGRI-CHOICE (U) LTD | China | Glyphosate |
| 32 | CONTAINER VILLAGE TRADERS COOPERATIVE SOCIETY | China | Glyphosate |
| 33 | DAPS UGANDA LTD | China | Glyphosate |
| 34 | ERAM Uganda Ltd | Spain | Chlorfenvinphos |
| 35 | ETG | China | Glyphosate |
| 36 | KAKIRA SUGAR WORKS | India | Glyphosate |
| 37 | MOMO AGROCHEMICALS | China | Glyphosate |

***Section of list as per February 2021***

**Appendix 6: Most imported and distributed HHPs in Uganda**

| HHP Active Ingredient | No of local distributors | | HHP Active Ingredient | No of local distributors | | HHP Active Ingredient | No of local distributors |
|---|---|---|---|---|---|---|---|
| Glyphosate IPA | **31** | | Atrazine | **4** | | Bifenthrin | **1** |
| Mancozeb | **19** | | Carbendazim | **4** | | Chlorfenvinphos | **1** |
| Chlorpyrifos | **12** | | Dichlorvos (DDVP) | **4** | | Chlorothalonil | **1** |
| Abamectin | **11** | | Emamectin | **4** | | Fenamiphos | **1** |
| Cypermethrin | **11** | | Pirimiphos-methyl | **4** | | Fenitrothion | **1** |
| Dimethoate | **10** | | Thiamethoxam | **4** | | Fenvalerate | **1** |
| Profenofos | **10** | | Butachlor | **3** | | Fipronil | **1** |
| Imidacloprid | **9** | | Carbofuran | **3** | | Lufenuron | **1** |
| Malathion | **8** | | Diuron | **3** | | Maneb | **1** |
| Deltamethrin | **7** | | Carbosulfan | **2** | | Oxadiazon | **1** |
| Lambda-cyhalothrin | **6** | | Glufosinate Ammonium | **2** | | Oxyfluorfen | **1** |
| Pendimethalin | **6** | | Indoxacarb | **2** | | Permethrin | **1** |
| Alpha-Cypermethrin | **4** | | Metribuzin | **2** | | Thiophanate-methyl | **1** |

**Appendix 7: Identification for HHPs Criteria in Uganda**

(Using Group 1 Acute Toxicity: WHO1a, WHO1b, fatal if inhaled (H330); Group 2 longterm effects (EPA carc, EU GHG carc, IARC prob carc, EPA pro likely carc; EU GHS (1A, 1B), EU GHS (1A, 1B), EU GHS repro (1A, 1B), EU EDC (1) or C2 & R2 GHS; Group 3: Environmental toxicity; and Group 4: Conventions – Montreal, Rotterdam and Stockholm)

| | | Group 1: Acute Toxicity | | | Group 2: Long-term effects | | | | | | | | Group 3: Environmental toxicity | | | | Group 4: Conventions | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Active Ingredient | Registered Use | WHO Ia | WHO Ib | Fatal if inhaled (H330) | EPA carc | IARC carc | EU GHS carc (1A. | IARC prob carc | EPA prop likel carc | EU GHS muta | EU GHS repro | EU EDC (1) or C2 & R2 | very bio acc | very persis. water, soil or sediment | very toxic to aquatic organisms | highly toxic to bees | Montreal Protocol | Rotterdam Convention (PIC) | Stockholm convention (POP) |
| Abamectin | Insecticide | | | 1 | | | | | | | | | | | | 1 | | | |
| Alachlor | | | | | | | | | | | | 1 | | | | | | 1 | |
| Aldicarb | Insecticide | 1 | | 1 | | | | | | | | | | | | 1 | | 1 | |
| Atrazine | Herbicide | | | | | | | | | | | 1 | | | | | | | |
| Azinphos-ethyl | | | 1 | | | | | | | | | | | | | 1 | | | |
| Azinphos-methyl | | | 1 | 1 | | | | | | | | | | | | 1 | | 1 | |
| Bendiocarb | Insecticide | | | | | | | | | | | | | | | 1 | | | |
| Benomyl | | | | | | | | | | 1 | 1 | | | | | | | 1 | |
| Butachlor | Herbicide | | | | | | | | 1 | | | | | | | | | | |
| Carbaryl | | | | | | | | | 1 | | | 1 | | | | 1 | | | |
| Cabendazim | Fungicide | | | | | | | | | 1 | 1 | | | | | | | | |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbofuran | Insecticide | | 1 | 1 | | | | | | | | | | | 1 | | 1 | |
| Carbosulfan | Insecticide | | | 1 | | | | | | | | | | | 1 | | 1 | |
| Chlorfenvinphos | Acaricide | | 1 | | | | | | | | | | | | 1 | | | |
| Chlorothalonil | Fungicide | | | 1 | | | | | 1 | | | | | | | | | |
| Chlorpyrifos | Insecticide | | | | | | | | | | | | | | 1 | | | |
| Coumaphos | | | 1 | 1 | | | | | | | 1 | | | | | | | |
| Cypermethrin | Insecticide | | | | | | | | | | | | | | 1 | | | |
| Deltamethrin | Insecticide | | | | - | | | | | | | 1 | | | 1 | | | |
| Diazinon | Insecticide | | | | | 1 | | | | | | | | | 1 | | | |
| Dichlorvos (DDVP) | Insecticide | | 1 | 1 | | | | | | | | | | | 1 | | | |
| Dimethoate | Insecticide | | | | | | | | | | | | | | 1 | | | |
| Emamectin benzoate | Insecticide | | | | | | | | | | | | | 1 | 1 | 1 | | |
| Ethylene thiourea | | | | | | | | | 1 | | 1 | 1 | | | | | | |
| Fenitrothion | Insecticide | | | | | | | | | | | 1 | | | | 1 | | |
| Fenvalerate | Insecticide | | | | | | | | | | | | | | | 1 | | |
| Fipronil | insecticide/ Acaricide | | | | | | | | | | | | | | | 1 | | |
| Glyphosate | Herbicide | | | | | | | 1 | | | | | | | | | | |
| Imidacloprid | Insecticide | | | | | | | | | | | | | | | 1 | | |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Malathion | Insecticide | | | | | | | 1 | | | | | | | | 1 | | |
| Mancozeb | Fungicide | | | | | | | | 1 | | | 1 | | | | | | |
| Maneb | Fungicide | | | | | | | | 1 | | | 1 | | | | | | |
| Methyl bromide | | | | | | | | | | | | | | | | | 1 | |
| Permethrin | Insecticide | | | | | | | | 1 | | | | | | | 1 | | |
| Paraquat dichloride / Paraquat dichloride >276g/L | Herbicide | | | 1 | | | | | | | | | | | | | | 1 |
| Pirimicarb | | | | | | | | | 1 | | | | | 1 | 1 | | | |
| Pirimiphos-methyl | | | | | | | | | | | | | | | | 1 | | |
| Profenofos | Insecticide | | | | | | | | | | | | | | | 1 | | |
| Thiamethoxam | Insecticide | | | | | | | | | | | | | | | 1 | | |
| Zinc phosphide | Rodenticide | | 1 | | | | | | | | | | | | | | | |