



PESTICIDES HARM REDUCTION

Evidence Based Science

(Excerpts)



ALTERNATIVES TO

**HIGHLY
HAZARDOUS
PESTICIDES**





Food and Agriculture
Organization of the
United Nations



World Health
Organization



International Code of Conduct on Pesticide Management

Guidelines on Highly Hazardous Pesticides



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Organization**

Food and Agriculture Organization of the United Nations
Rome, 2016

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Pesticide Risk Reduction

Due to increasing plant health threats, more pesticides are used every year around the world. Plantwise-Plus recognizes the urgent need to increase the uptake of lower-risk plant protection products and chemical pesticide alternatives by farmers.

The Pesticide risk reduction pathway is focused on raising awareness of, access to, and use of affordable integrated pest management solutions.

By working closely with national and local government entities, commercial enterprises, and farmers, we identify opportunities to reduce pesticide-related risks.

This includes identifying and implementing classical biocontrol methods and harnessing the potential of augmentative biocontrol and biopesticide solutions to reduce the impact of priority pests.

Table 1. WHO recommended classification of pesticides by hazard

		LD ₅₀ for the rat (mg/kg body weight)	
Class		Oral	Dermal
Ia	Extremely hazardous	< 5	< 50
Ib	Highly hazardous	5-50	50-200
II	Moderately hazardous	50-2000	200-2000
III	Slightly hazardous	Over 2000	Over 2000
U	Unlikely to present acute hazard	5000 or higher	

Note: The classification is based primarily on the acute oral and dermal toxicity to the rat since these determinations are standard procedures in toxicology. LD₅₀ is the amount of chemical required to provide a "lethal dose" to 50% of the test population. The smaller the LD₅₀, the more toxic the pesticide.

Human health effects of pesticides

ENDOCRINE DISRUPTION (affects hormone system)

CARCINOGENIC (causes cancer)

REPRODUCTIVE AND DEVELOPMENT TOXICITY (toxic to reproduction system and unborn child)

MUTAGENIC (changes genetic material)

NEUROTOXIC (toxic to the nervous system)

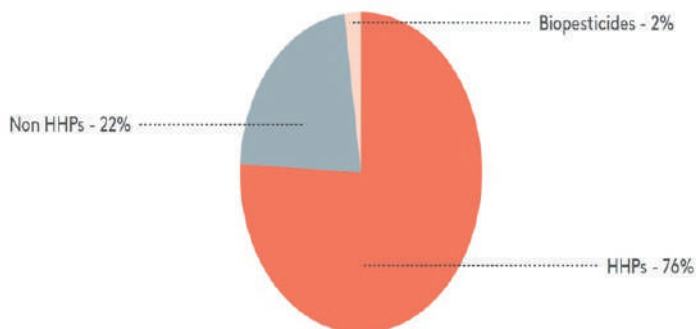


Figure 2. Share HHPs as the total volume of pesticides used in Kenya

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Which pesticides are HHPs?

Although the FAO and WHO developed criteria for HHPs, they have not published an official list that includes all HHPs used worldwide yet. This makes it challenging for governments, extension officers, distributors, and spray service providers to identify and replace HHPs with less hazardous alternatives. The international Pesticide Action Network (PAN) has filled this gap and published an HHP list in 2009. The "PAN International List of HHPs" has been used for the analysis in this report⁵.

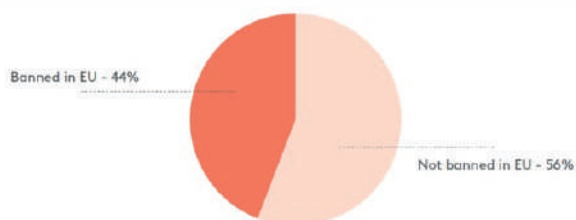


Figure 3. Share of pesticides banned in the EU as the total volume of pesticides in Kenya

1

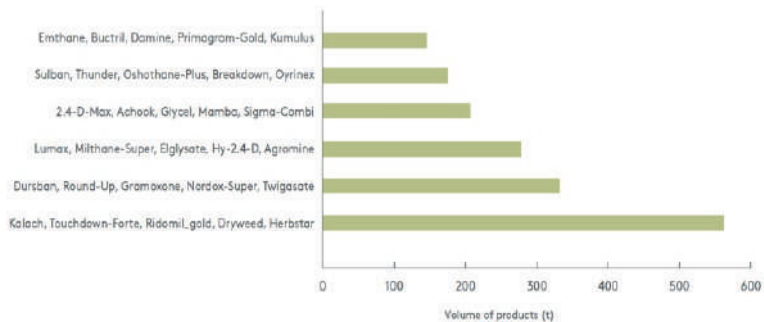


Figure 5. The top 30 products in Kenya according to volume of application

Note: Products pooled due to observe restricted data rights.

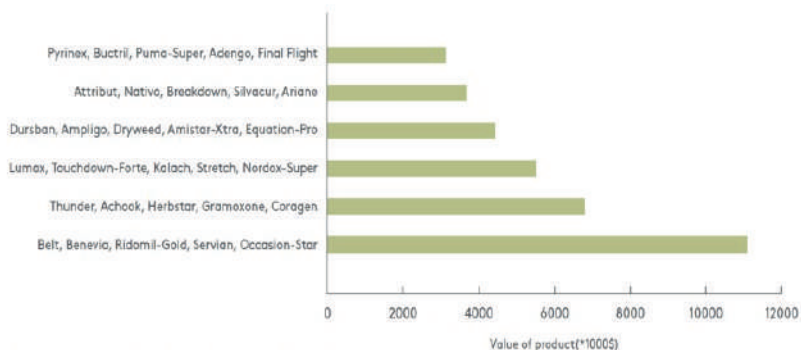


Figure 6. Top 30 products in Kenya with the highest sales value

Note: Products pooled due to observe restricted data rights.

Table 7. Summary of bio-products used in Kenya in 2020 and their product value

	Active Ingredient	Crops	Area Treated (1000 ha)	Product Volume (1000 kg;l)	Product value (1000 US\$)
Achook	Azadirachtin	Bananas, Coffee, Beans, Maize, Peas, Tea, Tomatoes, Brassicas	16.8	42.0	1436.9
Flower-D5	Pyrethrins	Beans, Peas	2.4	4.7	205.4
Halt	Bacillus-thuringiensis	Brassicas	1.6	0.8	33.2
Biocatch	Verticillium	Beans	0.2	0.8	10.2
Bio-Magic	Metarhizium-anisopliae	Beans	0.1	0.4	5.1
Trianum-P	Trichoderma	Beans	0.04	0.1	5.8
Bio-Nematon	Faecilomyces	Beans, Tomatoes	0.02	0.1	1.9
Sum			21.1	48.9	1696.4

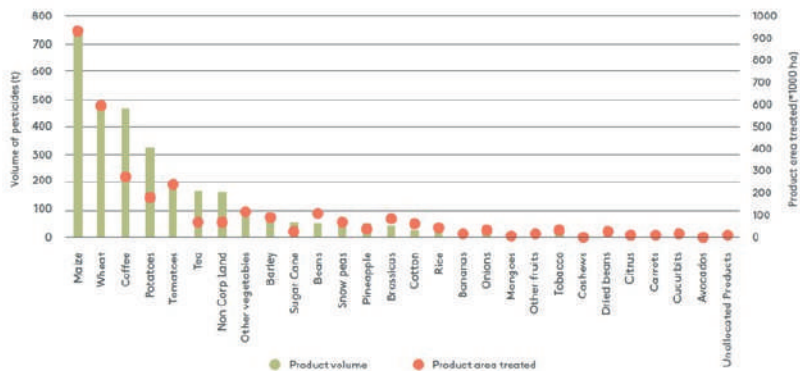
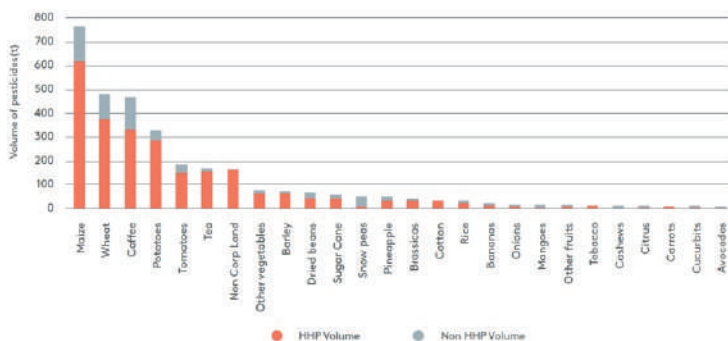


Figure 10. Volume of products used on different crops in relation to area treated per crop

Most pesticides used on different crops in Kenya are categorized as Highly Hazardous Pesticides. Pesticides categorized as non HHPs only make up 22%.



The glyphosate controversy

- In 2019, the Ministry of Health in Kenya submitted an official recommendation to remove all products containing glyphosate to safeguard the public against risks, harm and exposure.
- The WHO has classified glyphosate as **probably** carcinogenic (more research needed).

Mancozeb-a fungicide

Scientists in Kenya have called for the immediate withdrawal of mancozeb because it is widely used by farmers in Kenya, but has been found to cause cancer and is toxic to reproductive and endocrine systems. Mancozeb is banned in the EU.

Residues in Kirinyaga County

A study by Kenya Organic Agriculture Network (KOAN) and EcoTrac Consulting found concerning pesticide residues in tomatoes from three markets in Kirinyaga County. The levels of acephate exceeded the allowed MRL in all the samples. Acephate is a strong endocrine disrupter, is a possible carcinogenic and neurotoxicant. The PCPB has registered acephate to control aphids, whiteflies and thrips on roses and tobacco and for the control of the Fall Armyworm on maize. The presence of acephate on tomatoes is a threat to food safety and illustrates pesticides are being misused by farmers²⁰ and should be addressed by government. Training and alternatives need to be provided.



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Poisonings in Kenya

A retrospective study of poisoned patients admitted at Kenyatta National Hospital between January 2002 and June 2003 shows that the most common type of poisoning was by pesticides (43%) followed by household agents (24%) and prescription drugs (14%). Organophosphates and rodenticides were the two most common pesticides accounting for 57.4% and 31% of poisoning, respectively. The major organophosphate encountered was diazinon²¹. Globally 385 million people suffer from unintended pesticide poisoning each year; 95% live in the Global South²².

KNH is a national referral hospital and patients are admitted from all parts of Kenya. The results of the study are expected to mirror the situation in the rest of the country. However, Kenya does not have a good network of poison control centres and therefore the exact number of acute poisonings each year is unreported. Many pesticides are in use that have chronic effects on reproduction, are endocrine disruptors or are carcinogenic. Chronic ailments arising from pesticides exposure over the long-term are not monitored.

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Recommendations

1. Phase out HHPs.
2. Implement Integrated Pest Management Strategies.
3. Promote Access to Knowledge and Information.
4. Invest in Research on Biopesticides and Biocontrol Methods.
5. Ensure Affordability of Pesticides.
6. Address Corporate Accountability.

Mitigating Risks to Pesticides

1. Creation of buffer zones.
2. Educate the users on pest management and pest management options.
3. Use of PPEs for users.
4. Proper and appropriate labelling of pesticides targeting those not able to read as well.
5. Observe preharvest times properly.
6. Have policies for environmental toxicity protection.
7. Pesticide regulation and prioritizing pesticides to withdraw.
8. Integrate pest management strategies.



HARM REDUCTION SOCIETY

KENYA

Saving lives through Harm Reduction.