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Pesticide Discussion Forum Summary Digest

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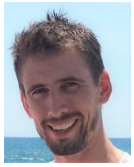
The dangers of paraquat and lessons learned from phasing it out

Paraquat stands out as one of the most lethal pesticides in common use, frequently involved in fatal incidents due to suicides or accidental exposure. Even though paraquat has been banned in over 67 countries, it is still widely used in many others, particularly in Asia and Latin America. Based on a literature review and a consultation process, Stuart et al (2022) conducted a review study to identify options for replacing paraquat and to distil practical lessons from numerous successes around the world. Production data consistently failed to show any negative effects of banning paraquat on agricultural productivity. A wide range of alternative approaches to weed management and crop defoliation are available, many of which do not rely on herbicides. It was concluded from the findings of this study that eliminating paraquat will save lives without reducing agricultural productivity (Stuart *et al.*, 2022). Less hazardous and more sustainable alternatives exist.

This document is a summary of the University of Cape Town's Division of Environmental Health's Pesticide Community of Practice held on the 24th of November 2022, titled: "The dangers of paraquat and lessons learned from phasing it out". This digest presents the issues and points raised, and the information shared by participants in response to three questions prepared by the presenters, Michael Eddleston from the Centre for Pesticide Suicide Prevention and Alex Stuart from the Pesticide Action Network, UK. A total of 67 participants joined the live discussion. From the members who attended, 57% were from Africa, 25% were from Europe, 12% were from Latin America and the Caribbean, 3% were from South-East Asia and 1% were from Western Pacific and the Eastern Mediterranean, respectively.

About the Presenters

Michael Eddleston is Professor of Clinical Toxicology at the University of Edinburgh. He has worked on pesticide suicides for more than twenty years. He is a doctor who cares for poisoned patients and a researcher who attempts to stop people dying from pesticide poisoning, by working with patients, communities, and governments.



Alex Stuart is an agroecologist at Pesticide Action Network (PAN) UK. He has over 10 years of experience conducting research and training in agroecology and sustainable crop management and conducted his PhD on rodent ecology and management. Before joining PAN, Alex worked at the International Rice Research Institute, based in Philippines and Indonesia.

DISCLAIMER: The information below represents the opinions of members participating from different countries expressed during the discussion and shall not necessarily be taken to reflect the official opinion of the DEH, UCT, FAO, or KemI.

PRESENTED BELOW ARE THE THREE QUESTIONS AND RESULTING DISCUSSION INPUTS FROM PARTICIPANTS:

Question 1: Are you aware of health problems with paraquat? If yes, please give examples in the chat (List your country in your response and how recent the cases of health problems were).

YES

NIGERIA:

- In 2018, a farmer experienced a fatality due to paraquat use. Doctors could not diagnose the farmer until conducting an interview (i.e., which pesticides are used during work). The farmer subsequently passed away due to respiratory complications.
- Paraquat remains to be used in Nigeria and packed in different bottles.

MALAWI:

- Though paraquat is banned in the country, there are cases of smuggling from neighbouring countries.
- Health effects from paraquat exposure include liver failure, muscle weakness and seizures (CDC).

SOUTH AFRICA:
- Two cases were reported in one week (24th November 2022), of which, one was intentional and the other accidental. In the one case, the patient thought the paraquat was water and drank it.
- In 2016 a hospital in Empangeni reported an attempted suicide and the pesticide was identified as paraquat. The patient had died due to organ failure including kidney, liver, and respiratory failure. The patient was in renal failure and had difficulty speaking and swallowing.
- Paraquat is used in agriculture by farm workers or low- and middle-income groups working in rural areas. The product is used under a generic name.

IRAN:
- Many people were killed by Paraquat from direct exposure or suicides a few years ago in the country. However, there is uncertainty as to whether it is happening now.

INDIA:
- Paraquat is used in India.

LAOS:
- There have been concerning videos of paraquat being used in Laos recently. Porous borders create challenges for authorities to control it.

ST VINCENT:
- In St. Vincent, given the general unawareness of paraquat's dangers, end-users are likely to be exposed to it.

NO

CAMEROON:
- Paraquat was registered for use in Cameroon, however, it has recently been suspended.

ETHIOPIA:
- There is a lack of awareness of the hazards of paraquat because it is not widely used in the country.

RWANDA:
- In Rwanda Paraquat is on the list of prohibited pesticides. Therefore, it is not used widely and there are few cases of exposure.
- Though herbicides have been used for controlling weeds, paraquat is not on the list.

UGANDA:
- Paraquat is banned in the country.

ZAMBIA:
- Paraquat has been identified as a highly hazardous pesticide in Zambia and is scheduled to be restricted or banned soon.

UNITED KINGDOM (UK):
- The UK exports paraquat despite it being banned in the country.

Question 2: Do you know of any examples of successful alternatives approaches to paraquat use – for either weed management or crop desiccation? If so, please provide examples in the chat (List your country in your response).

	AFRICA
GUYANA	➢ Many vegetable and cash crop farmers use paraquat in weed control.
MALAWI	➢ Paraquat use has been replaced with other herbicides like glyphosate.
NIGERIA	➢ The use of small agricultural machines like row weeders assisted in reducing the use of paraquat in Nigeria. It is less labour-intensive and saves time. ➢ It is used for cassava and vegetables in Nigeria.
RWANDA	➢ In Rwanda, the alternative method used is mechanical control.
SOUTH AFRICA	➢ Not an example of paraquat, but in Cape Town, a university had a standard policy of spraying herbicides around campus (while students were present) for controlling weeds. However, the university moved to mechanical control for all its campuses.
ZIMBABWE	➢ Mechanical weed control is an alternative. ➢ Intercrops and integrated weed management practices are alternative approaches.
	MIDDLE EAST
IRAN	➢ 2-4-D +MCPA & Diuron are used as alternatives.
	NORTH AMERICA
COSTA RICA	➢ In Costa Rica, paraquat is used to desiccate the pineapple plant after it has been harvested to control flies.
	EUROPE
SWITZERLAND	➢ Paraquat was not promoted as a harvest aid for potatoes in Europe but for pre-planting or early post-planting.

Question 3: What recommendations do you have for overcoming barriers to banning paraquat?

INFORMATION ON HEALTH RISKS

- Information should be provided on the health risks associated with paraquat and the alternatives available in the country.
- Health risk information is only available to regulators and not end-users. More effort is needed to demonstrate the effectiveness of other alternatives that are readily available on the market.
- Many agricultural extension agents do not provide information on the effects of pesticides on agricultural workers instead, they provide education to promote the use of pesticides for high-crop production.

DIFFERENTIATE BETWEEN SMALL- AND LARGE-SCALE FARMERS

- Farmers are often referred to as a heterogeneous group. However, it would be interesting to know whether it is difficult to convince "farmers" equally that are large-scale commercial farmers versus small-scale farmers.
- Large-scale commercial farmers are considered as not being at risk of exposure due to the "safe use" and their adopting behaviour. However, they are not most farmers. Small-scale farmers are the majority. However, small-scale farmers are difficult to engage with when introducing new technologies. In addition, some small-scale farmers struggle with literacy barriers and as a result, are unable to comprehend pesticide labels.
- If paraquat is registered in countries, commercial farmers will continue to use it.
- When considering alternatives, commercial farms should be considered.
- Large-scale farmers are affected more by pesticide bans.

TRAINING AND PEER DISCUSSIONS

- Training and peer discussions about the health effects of paraquat among agricultural workers are helping to overcome barriers to banning paraquat.
- Grassroots training will be important to overcome the barriers. It should be tailored for the farmers using paraquat.
- Field demonstrations using alternatives will help farmers believe that the alternatives provided are effective.

ALTERNATIVES

- Safer alternatives should be suggested.
- Safer, more effective, and cheaper alternatives should be available

POLICY

- Farmer-friendly policies should be put in place.
- Heavy penalties for illegal traders and dealers should be given.

GLOBAL CAMPAIGNS

- Global campaigns through the Food and Agriculture Organization should be conducted globally to combat paraquat use.
- More awareness activities should be carried out.
- Production companies/corporations should be stopped from producing paraquat with big global fines.
- Globally, paraquat should be banned from being produced and exported to other countries.

DATA GENERATION

- There is a need for more data on alternatives.

ADDRESSING BARRIERS TOWARDS CLOSED TRANSFER SYSTEMS (CTS)

- Farmers should use "Closed Transfer Systems" (CTS). CTS is a pack and sprayer that isolates the operator from the concentrate. The product is recommended to be stored and locked away in farm chemical stores between field operations. However, most low- and middle-income countries do not have access to CTS and in Africa, many small-scale farmers keep products in their homes or in the grain storage, because of the structure of homesteads and that many are told the products are safe if they use personal protective equipment.

RESOURCE LIST

1. Stuart A, Merfield C, Horgan F et al. (in press) Agriculture without paraquat is feasible without loss of productivity. Lessons learned from phasing out a highly hazardous herbicide. Environmental Science and Pollution Research
2. Eddleston M, Nagami H, Lin C-Y, Davis ML, Chang S-S (2022) Pesticide use, agricultural outputs, and pesticide poisoning deaths in Japan. Clinical Toxicology 60, 933-941
3. Dinham, B (2004) Why Paraquat should be banned. Outlooks on Pest Management, 268-271

If you are not a member, we invite you to join UCT's Pesticide Discussion Forum: https://forms.gle/NzYH5REfUruL3jdm6

The **Division of Environmental Health** (DEH) Pesticide Discussion Forum is a bi-monthly online seminar for pesticide regulators and resource persons, as well as students in the postgraduate Diploma in Pesticide Risk Management (DPRM). Our aim is to provide support for managing pesticide risks and implementing risk reduction strategies.
DEH is based in the School of Public Health and Family Medicine at the University of Cape Town (UCT). environmentalhealth@uct.ac.za

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