

Questions and answers on the use diazinon, malathion and glyphosate

September 2015

To date, WHO has not made any changes to the technical instructions for the use of diazinon and malathion in public health, nor for glyphosate. **Accordingly, the current technical recommendations remain in effect.**

Summary of the situation

In March 2015, the International Agency for Research on Cancer (IARC) evaluated the carcinogenicity of the organophosphorus insecticides diazinon, malathion, and glyphosate and reclassified them as “probably carcinogenic to humans” (Group 2A). IARC is the specialized cancer agency of the World Health Organization (WHO). The agency is an inter-disciplinary group that brings together skills in epidemiology, laboratory sciences and biostatistics to identify the causes of cancer so that preventive measures may be adopted and the burden of disease and associated suffering reduced.

The joint FAO/WHO Meeting on Pesticide Residues (JMPR) last evaluated diazinon, malathion and glyphosate for carcinogenicity in 1993¹, 1997² and 2004³, respectively, and concluded on the absence of carcinogenicity. The JMPR is an international scientific group of experts administered jointly by the Food and Agriculture Organization of the United Nations (FAO) and WHO, tasked with evaluating the risk associated with pesticide residues in food and elsewhere. It is also known as the Joint FAO/WHO Meeting.

The work of the IARC complements that of the JMPR. The IARC identifies and classifies hazards, while the JMPR assesses the risk of pesticide residues on food and elsewhere.

As a result of IARC’s announcement in March 2015, WHO created an expert task force of the WHO Core Assessment Group on Pesticide Residues in May 2015. This group included a representative of the relevant IARC working group and was tasked with reviewing the information available to IARC and determining whether new data have been generated since the last JMPR evaluations.

¹ http://www.fao.org/fileadmin/templates/agphome/documents/Pests_Pesticides/JMPR/Reports_1991-2006/Report1993.pdf
http://www.fao.org/fileadmin/templates/agphome/documents/Pests_Pesticides/JMPR/Evaluation06/Diazinon06.pdf

² http://www.fao.org/fileadmin/templates/agphome/documents/Pests_Pesticides/JMPR/Reports_1991-2006/Report97.pdf

³ http://www.fao.org/fileadmin/templates/agphome/documents/Pests_Pesticides/JMPR/Reports_1991-2006/report2004jmpr.pdf

After consideration of the report and the work of the WHO expert task force provided to the JMPR Secretariat, the JMPR recommends the following actions in line with its core principles and procedures⁴:

- Given that the last full assessments of diazinon, malathion and glyphosate were done more than a decade ago and given that there are a number of new studies available, JMPR recommends the toxicological re-evaluation of these compounds. In accordance with JMPR procedures, this re-evaluation should consider all health end-points, including carcinogenicity. Residue experts should also be involved to identify possible impacts of the re-evaluation on recommended maximum residue levels (MRLs).
- Considering the importance of genotoxicity in the risk analysis process for setting MRLs, experts from the field of genotoxicity and mutagenesis should be consulted.
- JMPR should make a transparent analysis and use of the criteria and approaches selected to determine the quality, relevance and utility of all published and proprietary studies considered.
- Toxicological evaluations should focus on the active compounds and not on commercial pesticide products (formulations). Information from studies on commercial products (e.g. epidemiological studies) should be included when relevant.
- In accordance with its mandate and expertise, the work of JMPR should focus on exposure from residues in food. However, consideration of other exposure routes, such as the use of products for vector control, is also important for public health. Relevant expertise and data should be considered when planning the assessment so that recommendations can be provided regarding exposure from sources other than residues in food (e.g. indoor air).

To date, WHO has not made any changes to the technical instructions for the use of diazinon and malathion in public health, nor for glyphosate. **Accordingly, the current technical recommendations remain in effect.**

The Regional Program on Public Health Entomology of the Pan American Health Organization (PAHO/WHO) has consulted the WHO Pesticide Evaluation Scheme (WHOPES) with respect to its position on this subject. WHOPES is the WHO program responsible for promoting and coordinating the testing and evaluation of pesticides for public health. As the risk assessment and studies have not been concluded, the instructions for use of these products have not changed.

⁴ http://www.who.int/foodsafety/areas_work/chemical-risks/jmpr/en/

PAHO/WHO is closely following the matter and, when WHO takes a final position, its technical guidelines and recommendations will be broadly disseminated.

Frequently asked questions

What are the health risks associated with pesticide use?

Pesticides are chemical products used in agriculture to protect crops from insects, fungi, weeds, and other pests. In addition to their use in agriculture, pesticides are also intended to protect public health by controlling disease vectors. However, pesticides are potentially toxic to humans. They can cause adverse health effects, such as cancer, and can affect reproduction, the immune system, or the nervous system. Before being authorized for use, pesticides must be tested for all potential health effects, and the results need to be analyzed by experts who assess the risk to humans.

PAHO/WHO only recommends pesticides evaluated and tested by WHOPES for safety and effectiveness. Furthermore, in order to safely apply pesticides, all internationally recommended and accepted technical, personal protection, and safety standards must be followed.

“Hazard” and “risk”: what is the difference?

Scientific studies on the possible health effects of hazardous chemical substances such as pesticides make it possible to classify them as carcinogens (those that can cause cancer), neurotoxins (those that can harm the brain), or teratogens (those that can harm the fetus). This classification process, called “hazard identification,” is the first step in “risk assessment.” An example of hazard identification is the classification of substances based on their carcinogenicity in humans. That classification is done by the International Agency for Research on Cancer (IARC), an agency of WHO.

The same chemical product can have different effects in different doses. Effects also depend on the amount of the chemical substance to which a person is exposed and on the exposure pathway, i.e. ingestion, inhalation, or injection.

Why does WHO have two different processes for “hazard identification” and “risk assessment”?

“Hazard identification,” in particular the IARC classification of substances based on their carcinogenicity, is the first step in the “risk assessment” process. The classification of an agent as a carcinogenic risk is an important indication that a certain exposure level, for example, based on the type of task, environment, food, etc., could result in a greater risk of cancer.

A risk assessment of pesticide residues in food, like that performed by the Joint FAO/WHO Meeting on Pesticide Residues (JMPR), establishes what is considered a

safe consumption level. Admissible daily intakes (ADI) are used by governments and international risk managers, such as the Codex Alimentarius Commission, to set the

maximum residue levels (MRLs) of pesticides in food. MRLs are imposed by national authorities to guarantee that the amount of pesticide to which consumers are exposed in the food they ingest during their life will not have adverse health effects.

The IARC hazard identification and the JMPR risk assessment are complementary activities. For example, the IARC can identify new evidence based on scientific studies on the carcinogenicity of a chemical substance and, when necessary, the JMPR evaluates or re-evaluates the safety of that chemical product since it is used on food.

What happens now with the pesticides assessed by IARC?

In March 2015, the IARC assessed the carcinogenicity of the organophosphorus pesticides: diazinon, malathion, and glyphosate and reclassified them as “probably carcinogenic to humans” (Group 2A).

In light of the possibility that new data exist, WHO resolved to create an expert task force to review and evaluate the information currently available on the subject and to determine whether or not to update the previous recommendations of the JMPR. The JMPR (or the Joint FAO/WHO Meeting) had previously met to evaluate the risk of the use of glyphosate in 2011⁵, diazinon in 2006⁶, and malathion in 2008⁷.

The JMPR meets periodically to examine residues, the analytical aspects of pesticides, and estimate maximum residue levels. The expert group also reviews toxicological data and estimate the admissible daily intake for humans of the pesticides under evaluation. (See at the beginning the latest recommendations on this subject)

How was the WHO expert task force that presented its conclusions to the JMPR formed?

Task force members were selected from the WHO list of experts in toxicology and epidemiology. This list consists of scientists who applied in response to the announcement or are members of the Panel of Experts on Food Safety. The applications were reviewed by an independent arbiter of WHO and by the JMPR Secretariat. Each expert must present a written declaration of interest. The selection process sought to balance the scientific knowledge and geographical representation of task force members. The group also includes a key expert who worked on the IARC Monograph addressing these organophosphorus compounds.

⁵ http://www.fao.org/fileadmin/templates/agphome/documents/Pests_Pesticides/JMPR/Report11/Glyphosate.pdf

⁶ http://www.fao.org/fileadmin/templates/agphome/documents/Pests_Pesticides/JMPR/Evaluation06/Diazinon06.pdf
http://www.fao.org/fileadmin/templates/agphome/documents/Pests_Pesticides/JMPR/JMPRrepor2006.pdf

⁷ http://www.fao.org/fileadmin/templates/agphome/documents/Pests_Pesticides/JMPR/Report08/Malathion.pdf
http://www.fao.org/fileadmin/templates/agphome/documents/Pests_Pesticides/JMPR/Evaluation08/malathion.pdf



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In light of this situation, what is WHO's recommendation with respect to these pesticides?

At this point, WHO **does not recommend** changing national policies and regulations. It recommends that countries take into account existing and future recommendations of the JMPR and Codex Alimentarius.

Does WHO support the prohibition of Glyphosate and Malathion?

To date, PAHO/WHO does not support the prohibition of these two pesticides until the JMPR assessments are completed. The Joint FAO/WHO Meeting (or JMPR) establishes safe exposure levels for these chemicals.

To date, malathion continues to be recommended for space spraying against mosquitoes by the WHO Pesticide Evaluation Scheme (WHOPES). The recommended doses as well as the instructions for use are described in the document *Recommended insecticides for space spraying against mosquitoes*, updated in July 2012.⁸ Diazinon remains on the list of products used in public health published by WHOPES.⁹

How can people be exposed to these chemicals?

Provided that the food consumed meets the pertinent international standards (Codex Alimentarius), there should not be concern from a health standpoint with food exposure to glyphosate and malathion. In rural areas and on farms, as well as in outdoor home areas, spraying with pesticides should be done with caution, using the necessary protective gear.

USEFUL LINKS:

List of members of the expert task force convened by WHO:

http://www.who.int/entity/foodsafety/areas_work/chemical-risks/list_of_experts1.pdf?ua=1

Terms of reference of the expert task force convened by WHO

http://www.who.int/entity/foodsafety/areas_work/chemical-risks/etc_final_new_1.pdf?ua=1

JMPR:

http://www.who.int/foodsafety/areas_work/chemical-risks/jmpr/en/

⁸ http://www.who.int/whopes/Insecticides_for_space_spraying_Jul_2012.pdf?ua=1

⁹ <http://www.who.int/whopes/quality/oldspecif/en/>