بسم الله الرحمن الرحيم

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RISK ASSESSMENT OF WIDELY USED HERBICIDES ON SOME FRUIT ORCHARDS IN EGYPT

By

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M. Sc. Agric. Sc. (Pesticide), Fac. of Agriculture, Ain Shams Univ., (2016)

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Approval Sheet

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ABSTRACT

Amira Salah Mahmoud Othman: Risk Assessment of Widely used Herbicides on Some Fruit Orchards in Egypt. Unpublished Ph.D. thesis, Department of Plant Protection, Faculty of Agriculture, Ain Shams university, 2022.

The aim of the present study is to assay the toxic effects and carried on risk assessment analysis for glyphosate and glufosinate ammonium using EIQ model and comparing the obtained results to conclude the possibility of recommending the use of glufosinate ammonium as a possible alternative to glyphosate.

The results of the toxicological tests showed different effects of both herbicides on exposed mice to the tested doses than untreated, represented by changes in some biochemical parameters indicative of liver and kidney functions, abnormalities in sperm cells, and effects that stimulated the activity of some genes related to brain and liver inflammation. Histopathological study confirmed convergent changes in brain and liver tissues. Conversely, the analysis of the results of the risk assessment for both pesticides using the Environmental Impact Quotient (EIQ) model showed a moderate Field Use Rating (EIQ FUR) value for glyphosate, and a low rate for glufosinate ammonium, which indicates that it is safer in terms of the environmental impact quotient than glyphosate, and that it can be used as an alternative for it in case of restriction or discontinuation of its use on orchids and other crops. These results confirm the importance of recommending users and applicators of both herbicides to take into account safety procedures and use protective clothing and tools to avoid exposure to each herbicide, in addition to adhering to good agricultural practices when using them.

Keywords: Risk Assessment, Glyphosate, Glufosinate Ammonium, EIQ, Non-Target Organism, Weed Control, Toxic Effects and Residue of Herbicides.

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