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An overview of pesticide toxicological reclassification in Brazil and how it can underestimate the use of banned pesticides by other agricultural countries

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Introduction: The alarming launch of new formulations of active ingredients already approved, as well as new active ingredients, have been breaking records in recent years in Brazil. National Health Surveillance Agency (ANVISA), which assesses the level of toxicity of chemicals to human health, recently published the regulatory framework for pesticides that established the toxicological reclassification of commercial products already on the Brazilian market. This study presents an overview of the toxicological reclassification of pesticides in Brazil and how it can underestimate the potential risk of pesticides banned by other agricultural countries.

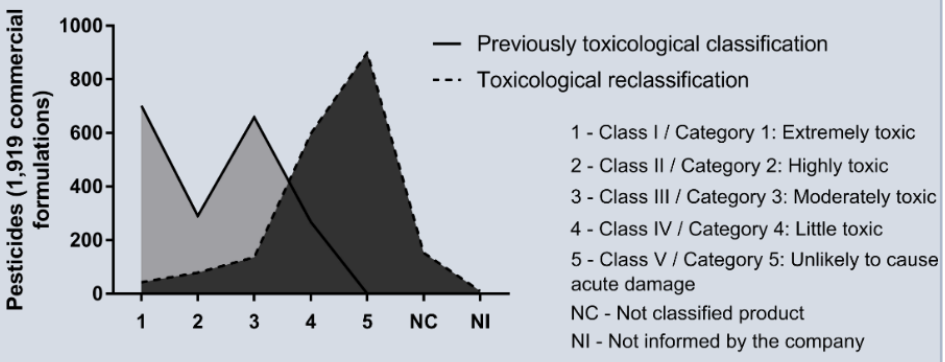

Fig. 1 Distribution of commercial pesticides in toxicological classes or categories before and after toxicological reclassification by the National Health Surveillance Agency (ANVISA) in Brazil.

Objectives: (a) present the scenario of the toxicological reclassification of pesticides in Brazil; and (b) the approval status of pesticide active ingredients in Brazil compared to other major agricultural producers in the world, European Union (EU), United States of America (USA) and China (CHN).

Table 1 Percentage of commercial pesticides in classes/categories before and after toxicological reclassification in Brazil

Classes / Categories	Previously toxicological classification	Toxicological reclassification
Class I / Category 1 – Extremely toxic	36.6% (702 pesticides)	2.2% (43 pesticides)
Class II / Category 2 – Highly toxic	15.1% (290 pesticides)	4.1% (79 pesticides)
Class III / Category 3 – Moderately toxic	34.3% (659 pesticides)	7.1% (136 pesticides)
Class IV / Category 4 – Little toxic	14.0% (268 pesticides)	31.2% (598 pesticides)
Category 5 – Product unlikely to cause acute damage	–	46.9% (900 pesticides)
Not classified	–	8.0% (153 pesticides)
Not informed by the company	–	0.5% (10 pesticides)
Total	1,919 pesticides	1,919 pesticides

Conclusion: This work showed how, after the new regulatory framework in Brazil, the redistribution of most commercial pesticide formulations resulted in the lowest risk category of the new classification and despite the fact that many of them contain active ingredients prohibited by regulatory actions in other agricultural nations.

Table 2 List of active ingredients of pesticides approved for outdoor agricultural use in Brazil that are banned, or with restricted use, or have not been approved for use in the European Union (EU), United States of America (USA) and/or China (CHN)

Pesticide active ingredient	Category	Country where banned/restricted*
Fenamiphos	Category 1 – Extremely toxic	CHN
Acephate	Category 2 – Highly toxic	EU
Chlorpyrifos		CHN*
Fenamiphos		CHN
Fomesafen		EU
Methidathion		EU; CHN*
Terbufos		EU; CHN
Thiodicarb		EU
Acephate	Category 3 – Moderately toxic	EU
Bifenthrin		EU
Chlorpyrifos		CHN*
Cyanamide		EU
Fenpropathrin		EU
Fenvalerate		CHN*
Methomyl		CHN*
Propargite		EU
Tebuthiuron		EU
Thiodicarb		EU
Acephate	Category 4 – Little toxic	EU
Acifluorfen		EU
Ametryn		EU
Amitraz		EU
Asulam		EU
Atrazine		EU
Bifenthrin		EU
Bromacil		EU
Carbaryl		EU
Chlorfenapyr		EU; USA
Clothianidin		EU
Fentin hydroxide		EU
Fenvalerate		CHN*
Fluridone		EU
Imazethapyr		EU
Imidacloprid		EU
Lactofen		EU
Metsulfuron-Methyl		CHN
MSMA		EU
Picoxystrobin		EU
Profenofos		EU
Propanil		EU
Propargite	Category 5 – Unlikely to cause acute damage	EU
Simazine		EU
Tebuthiuron		EU
Thiamethoxam		EU
Thiazopyr		EU
Trifluralin		EU
Acephate		EU
Alachlor		EU
Ametryn		EU
Atrazine		EU
Dicloran		EU
Flumetsulam		EU
Fomesafen		EU
Hexazinone		EU
Imazapyr		EU
Imazethapyr		EU
Imidacloprid		EU
Iprodione		EU
Lactofen		EU
Linuron		EU
Metsulfuron-Methyl		CHN
Orthosulfamuron		EU
Picoxystrobin		EU
Prometryn		EU
Propanil		EU
Quinclorac		EU
Quintozene		EU
Sethoxydim		EU
Simazine		EU
Tebuthiuron		EU
Thiamethoxam		EU
Trifluralin		EU
Flubendiamide	Not classified product	USA
Hexazinone		EU
Trifluralin		EU
Acifluorfen	Not informed by the company	EU
MSMA		EU