

Eco-social profile of glyphosate

Prof. dr. Valerije Vrček


Faculty of Pharmacy and Biochemistry
University of Zagreb




Safe and sustainable food production in Croatia

- reducing synthetic pesticide use by IPM uptake with biocontrol

28 April 2023, 11:00 - 16:00 CET
Premises of the Veterinary Faculty of the University of Zagreb
(Clinical lecture hall) and Online
Language: English



Roundup ORIGINAL
HERBICIDE
Complete Directions for Use
EPA Reg. No. 524-445

← **trade name**
name product
is sold under

common name →
identifies active
ingredient

AVOID CONTACT OF HERBICIDE WITH FOLIAGE, GREEN STEMS, EXPOSED NON-WOODY ROOTS OR FRUIT OF CROPS (EXCEPT AS SPECIFIED FOR INDIVIDUAL ROUNDUP READY® CROPS), DESIRABLE PLANTS AND TREES, BECAUSE SEVERE INJURY OR DESTRUCTION MAY RESULT.
2004-1
Not all products recommended on this label are registered for use in California. Check the registration status of each product in California before using.
Read the entire label before using this product.
Use only according to label instructions.
It is a violation of Federal law to use this product in any manner inconsistent with its labeling.
Read the "LIMIT OF WARRANTY AND LIABILITY" statement at the end of the label before buying or using. If terms are not acceptable, return at once unopened.
THIS IS AN END-USE PRODUCT. THIS COMPANY DOES NOT INTEND AND HAS NOT REGISTERED IT FOR REFORMULATION. SEE INDIVIDUAL CONTAINER LABEL FOR REPACKAGING LIMITATIONS.

1.0 INGREDIENTS
ACTIVE INGREDIENT:
Glyphosate N-(phosphonomethyl)glycine
in the form of its isopropylamine salt 41.0%
OTHER INGREDIENTS: 59.0%
100.0%

chemical name
describes the active ingredient

Roundup is (not) glyphosate.
Glyphosate is ONLY an active principle in the formulation.

Roundup is a mixture of chemicals:
polyoxyethylene alkylamine (POEA),
surfactants,
adjuvants,
undisclosed additives...



Old toxicology: one substance – one effect

New toxicology: the effect of chemical mixtures

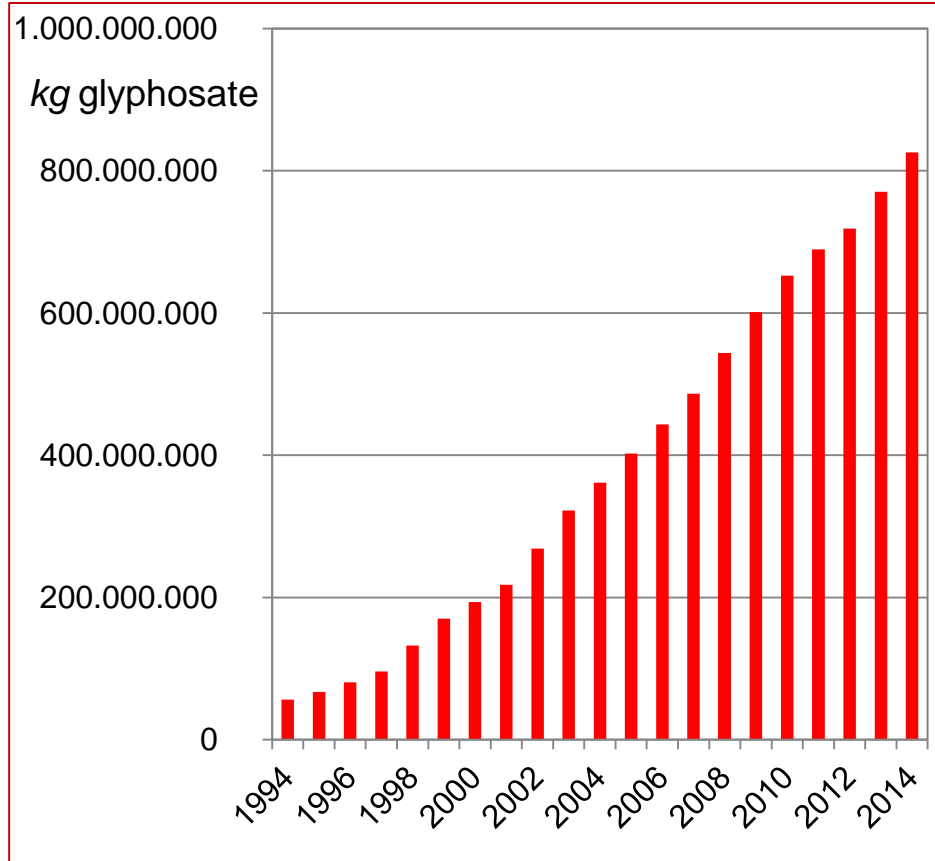
RESEARCH

Open Access



Trends in glyphosate herbicide use in the United States and globally



Charles M. Benbrook*



Glyphosate/Roundup is a **high-volume chemical**.
It is a blockbuster.

Therefore,
the ingredients matter.

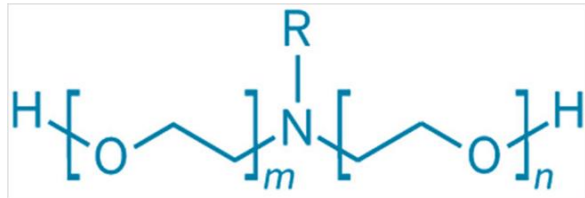
Ethoxylated adjuvants of glyphosate-based herbicides are active principles of human cell toxicity

R. Mesnage^{a,b}, B. Bernay^c, G.-E. Séralini^{a,b}  

^a University of Caen, EA2608, Institute of Biology, Risk Pole CNRS, Esplanade de la Paix, 14032 Caen, Cedex, France

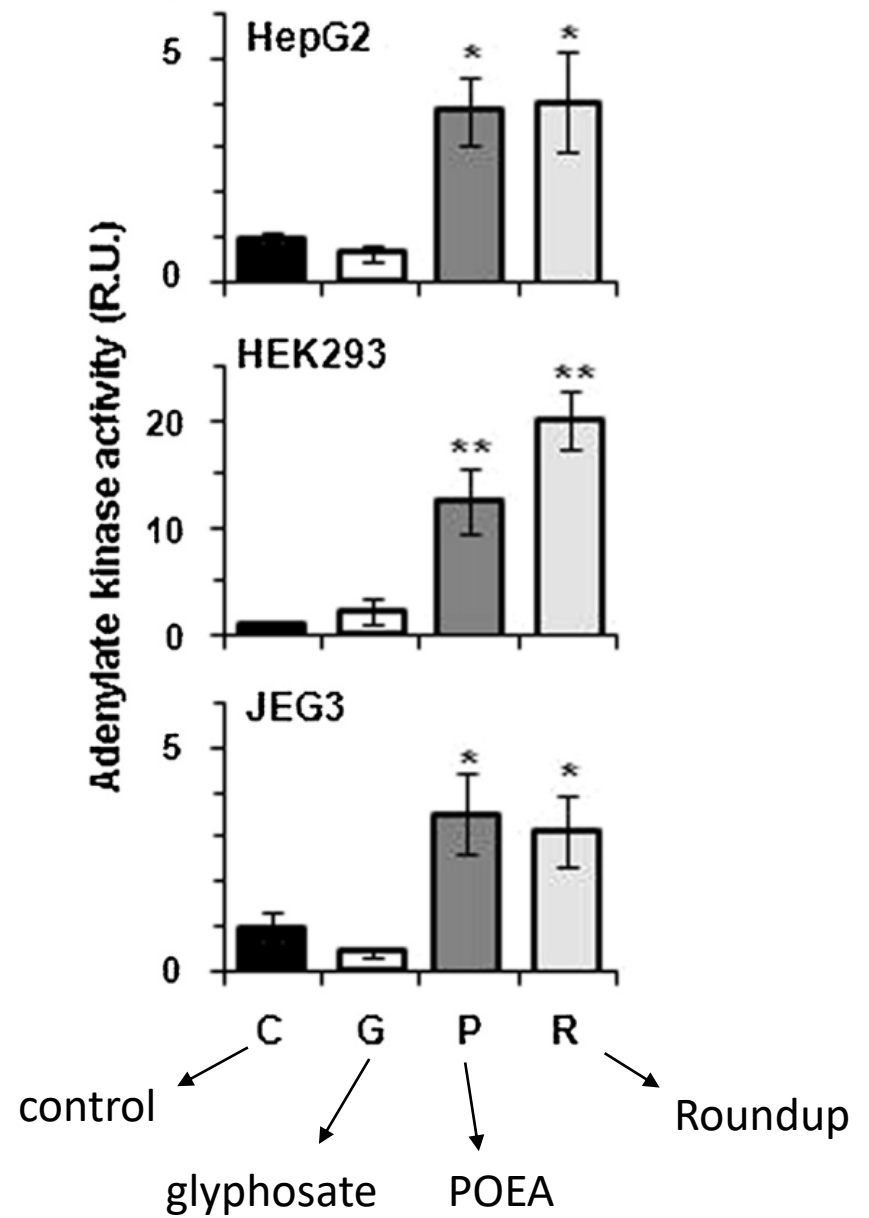
^b CRIIGEN, 40 rue de Monceau, 75008 Paris, France

^c Proteogen, SFR 146 ICORE, University of Caen, France



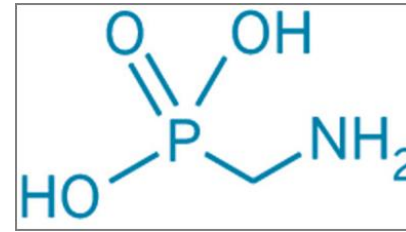
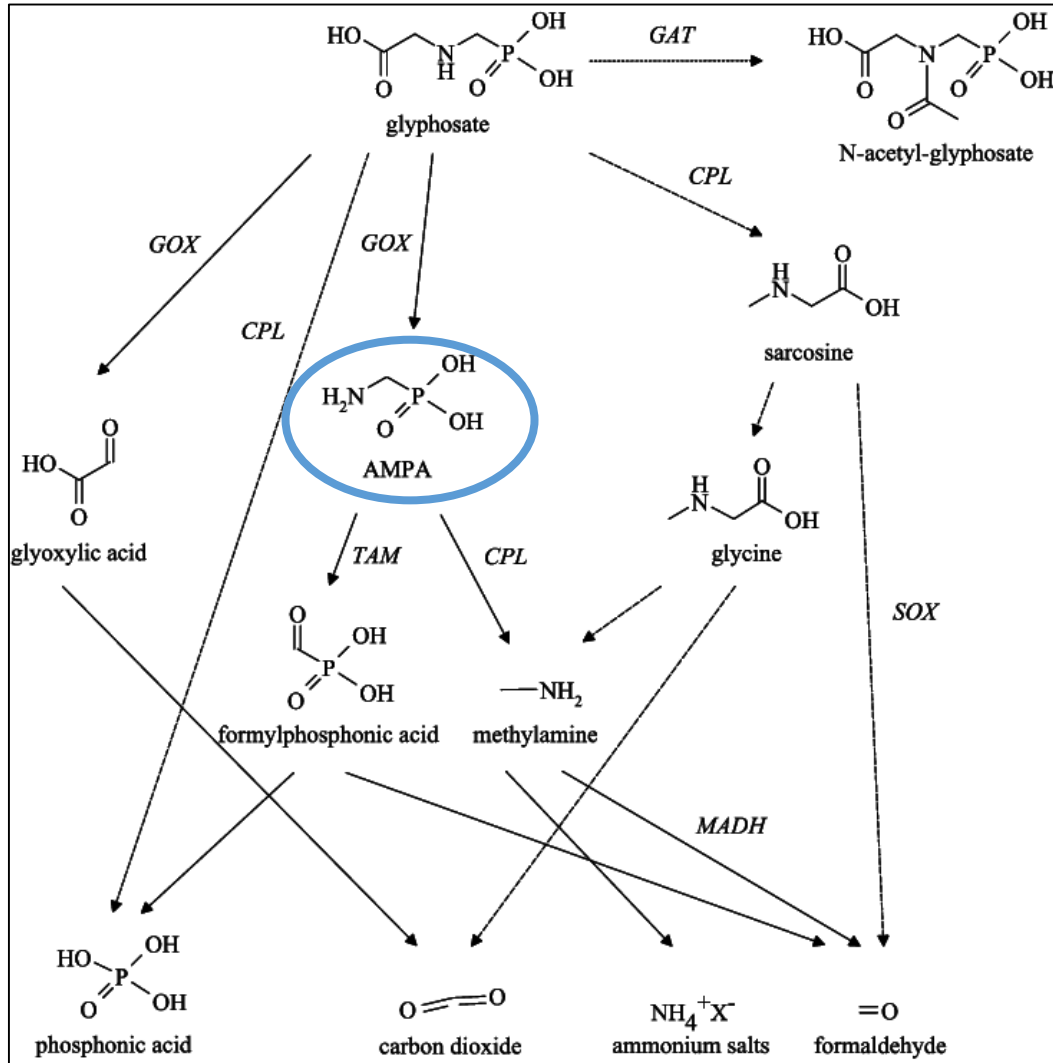
polyoxyethylene alkylamine (POEA)

„In conclusion, pesticide formulations should be studied as mixtures for toxic effects.”



What is the chemical fate of glyphosate?

New metabolites emerge in the environment:



Aminomethylphosphonic acid (AMPA)



Environmental Research

Volume 190, November 2020, 109944



Aminomethylphosphonic acid alters amphibian embryonic development at environmental concentrations

Marion Cheron, François Brischoux  

Centre d'Etudes Biologiques de Chizé, CEBC UMR 7372 CNRS-La Rochelle
Université, 79360 Villiers en Bois, France



Glyphosate dependent society

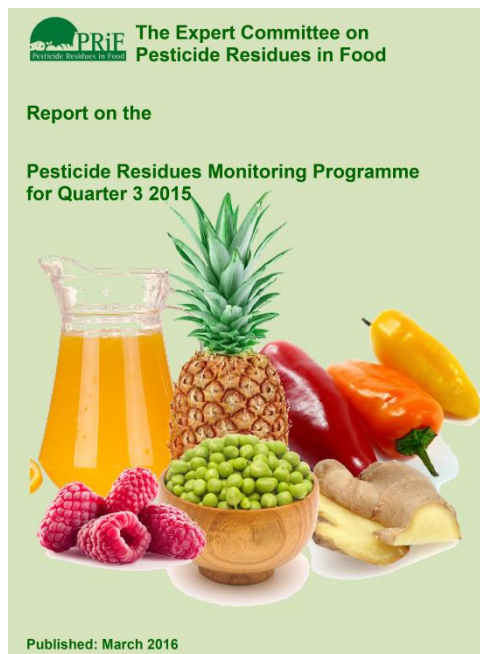
No glyphosate – no bread.
It is not (only) toxicology, it is a culture.

No beer with „no glyphosate“
It is a civilization failure.

US Department of
Agriculture (2011)

glyphosate > 2 ppm
> 90 % soy samples

AMPA > 2 ppm
> 95 % soy samples



Food Standard Agency
(October, 2012):

glyphosate > 0.2 mg/kg
in 25% bread samples



Umweltinstitut München e.V.
(2016):

glyphosate 0.5 - 30 µg/L
in each bottle

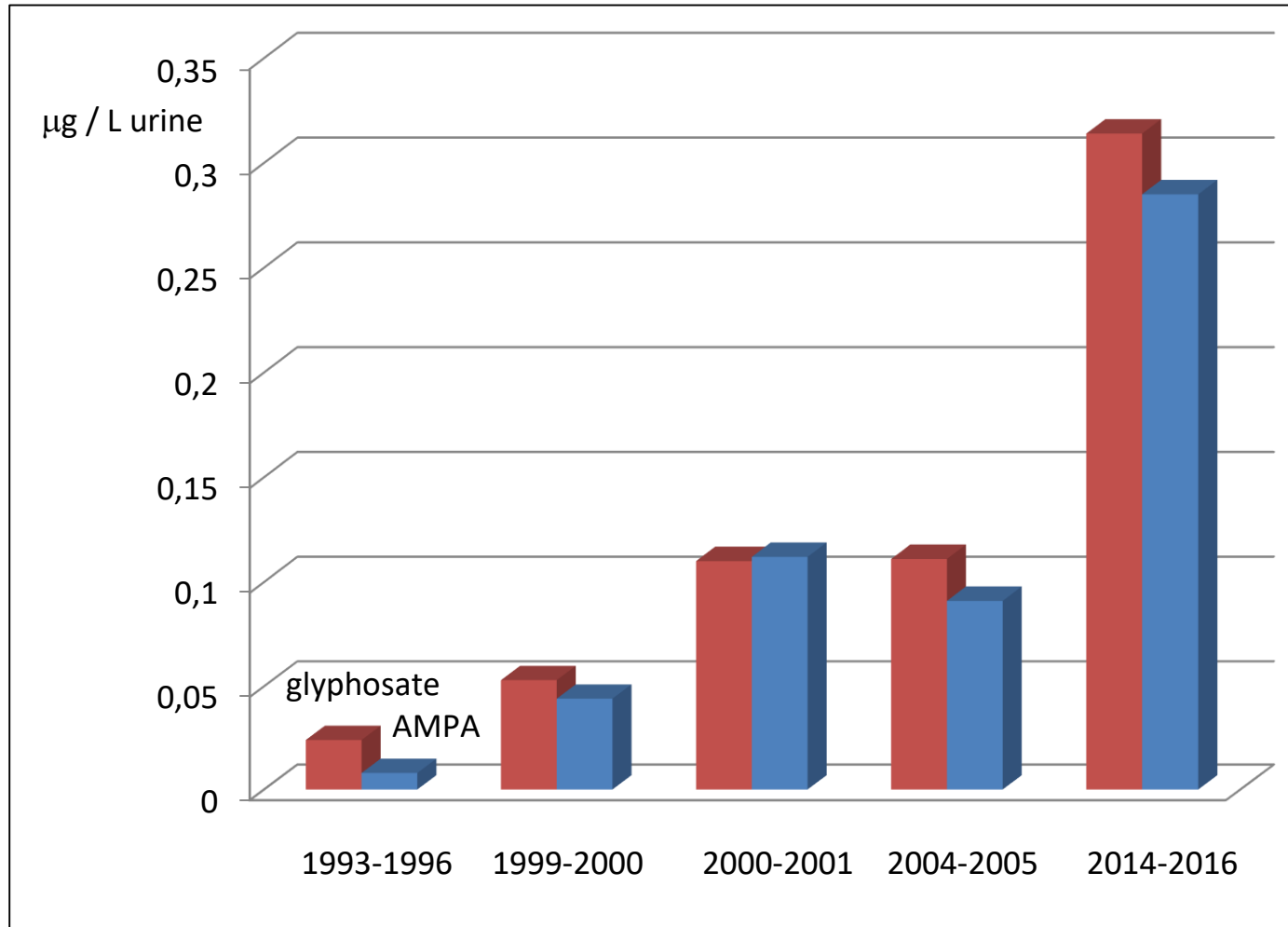
Excretion of the Herbicide Glyphosate in Older Adults Between 1993 and 2016

Paul J. Mills, PhD¹; Izabela Kania-Korwel, PhD²; John Fagan, PhD²; et al

[» Author Affiliations](#) | [Article Information](#)

JAMA. 2017;318(16):1610-1611. doi:10.1001/jama.2017.11726

We pee what we eat



Some conclusions:

- Glyphosate (and AMPA) are controversial in terms of safety and advantages.
- Ignoring risks is against precautionary principle. It is illiterate and immoral.
- No glyphosate – no GMO crops. Is GMO behind the scene ?

Thank you