December 09, 2025 Scientific Statement on pesticides in the Omnibus Package

Dear European Commission President Von der Leyen:

We, members of the scientific and medical community, are writing to underscore the **urgent need to better protect the environment, biodiversity and citizens against exposure to harmful pesticides**. We are increasingly concerned about shortcomings in the regulatory framework that is intended to ensure the safe approval of pesticide active substances and authorisation of plant protection products **(Regulation (EC) 1107/2009)**. The draft of the forthcoming Omnibus Simplification Package includes alarming changes to Regulation (EC) 1107/2009, which would **drastically undermine the EU's ability to respond to risks that only become evident once approved pesticides are in wide use** and create **loopholes that keep harmful pesticides in use**, even the ones with well-documented and recognised risks.

We call for European policymakers to reject the harmful revisions proposed in a draft of the Omnibus Bill and we offer recommendations for strengthening the risk assessment and management under the EU regulatory framework. A protective framework must:

- **Ensure pre-market risk assessment** of active substances and marketed pesticide products, including biocontrol, is based on the **latest**[1] **independent scientific and technical knowledge and robust, realistic assessment**. Testing should include sensitive indicators and real-world scenarios, such as improved assessment of the environmental and human health impacts of mixtures and those resulting from long-term and chronic exposures.

- **Maintain periodic and ad-hoc review** of active substances and pesticide products, including biocontrol, **to quickly respond to emerging risks that only emerge when pesticides are in wide use or new science becomes available**[2]. Stronger mechanisms for continuous reassessment should include data and monitoring systems to detect and respond to patterns of risk.

In light of these essential prerequisites, we discuss key shortcomings in the Omnibus proposal and recommendations for improvement:

1) Mandatory periodic review of approved pesticide active substances (*Art. 20*) is the principal mechanism for ensuring harmful effects emerging in real-world use leads to restriction and removal from the market.

The Omnibus proposes the removal of mandatory ten-year review of active substances approved at the EU level. **The essential safeguard of periodic reviews must not be removed**. Pesticide active substances are approved with pre-market tests and modelled scenarios that cannot capture the complexity of real-world pesticide use. Both periodic (*Art.*

20) and ad hoc (*Art. 21*) review allows regulators to incorporate new scientific insights which often emerge only after a pesticide is widely used and/or when academia has had the opportunity to evaluate these substances as well. Numerous examples show that pesticides can initially appear safer or less persistent during registration, then later prove harmful to ecosystems and human health under real use[3]. In fact, the link between systematic post-market monitoring and regulatory reassessment should be further strengthened, not removed: currently, real-world data from the monitoring of soil, surface water, groundwater and humans rarely trigger the re-evaluation of existing authorisations[4].

Further Recommendations: improve and harmonise monitoring program, data systems, and pesticide use registries to detect and act on emerging risks. Biocontrol and biopesticides must be included in monitoring and pesticide use registries, as well (See Annex).

2) Pesticides demonstrated to be harmful should be quickly removed from the market and use, linking the latest scientific evidence to the protection of humans and the environment.

The Omnibus proposes a grace period of 36 months for continued use of active substances deemed too toxic for use, opening farmers, consumers and the environment to potential harm when there is clear knowledge of unacceptable risks. **The grace period allowing for use of banned harmful pesticides should be reduced or eliminated, not increased.**

Further Recommendations: withdraw the approval of wider classes of pesticides already proven or strongly indicated to be particularly harmful (See Annex).

3) At the registration of plant protection products (PPPs), the latest available science must be considered by member state evaluators, ensuring the highest possible level of protection.

Individual pesticide active substances are first approved at the EU level, while the products (PPPs) containing these substances are later (re)approved by Member States. The Omnibus would remove the requirement for the inclusion of the latest available evidence on active substance hazards to be included when the products containing those are authorised, inconsistent with a recent CJEU ruling[5]. Without this requirement, PPP applicants can "copy-paste" conclusions from old dossiers as evidence, even if current scientific research undermines those older findings. **This loophole can cut out the best available knowledge of harm from the risk assessment process and should not be included.**

Recommendation: Create stronger inclusion criteria for independent scientific assessments during risk assessment, as current practice prioritises industry studies[6] (See Annex).

4) Pre-market assessment of pesticides should include more realistic and sensitive detection of hazards and risks, preventing more harmful pesticides from reaching the market.

While the Omnibus proposal does not specifically mention pre-market risk assessment evaluation requirements, we nonetheless draw attention to the opportunity for substantial improvement. In the current framework, pre-market assessments largely focus on individual active substances and controlled scenarios, overlooking the assessment of mixtures[7] that are widespread in the environment[8] and can be more harmful than their individual components[9]. The health impacts on particularly sensitive groups is still underdeveloped. Toxicity assessment is often based on only standard laboratory tests, which can fail to capture real world effects[10]. Exposure assessments are often based on simplistic routes of human uptake[11], failing to account for important knowledge gaps[12] in exposure science.

Recommendations: Expand pre-market evaluation to include better assessment of mixture effects, more sensitive toxicology tests, more screening for development and neurotoxicity, and more thorough assessment of human non-dietary uptake of pesticides (See Annex).

Independent scientific research has documented a range of environmental and health impacts linked to many pesticides, underscoring the need for precaution. Mixtures of residues are frequently found in soils, air, water, vegetation, crops, food, wildlife, and indoor environments[13]. Pesticides are a recognised driver of biodiversity decline, with evidence of direct and indirect effects on insects[14], birds[15], soil organisms[16], amphibians, fish and mammals[17]. Epidemiological and toxicological studies associate exposure to certain pesticides with increased risks of chronic health conditions[18], including specific cancers[19], neurodegenerative diseases (Alzheimer's, Parkinson's)[20], neurodevelopmental disorders[21], reproductive and fertility impacts[22], and immune or metabolic effects, including on the gut microbiome[23]. Risks may be higher for vulnerable groups such as pregnant women, infants and children, farmers, and residents of intensively farmed areas[24].

It is possible to achieve efficient and resilient cropping systems, while also keeping harmful pesticides off the market. Farmers across Europe are already practicing robust, ecosystem-based agriculture that phases out pesticides or uses them only exceptionally. Policymakers can help scale these approaches by **ensuring implementation of IPM**, strengthening **CAP incentives** for agroecological practices and supporting **independent advisory services.**

Taken together, the evidence is clear: many pesticides cause harm to human health and the environment, and much of this becomes **visible only after wide use**. Pre-market testing must be made more **robust, sensitive,** and **relevant for realistic use**, complemented by **regular science-based reviews to detect real-world risks**, while supportive policies help farmers adopt resilient, low-pesticide practices.

We respectfully ask you to protect biodiversity, ecosystems and human health through a strong risk assessment framework, rejecting the listed draft provisions in the Omnibus and considering further strengthening protections in Regulation (EC) No 1107/2009. We are at your disposal for further exchange of information.

Yours sincerely,

Lindsey Hendricks-Franco, Fellow; Josselin Rouillard, Senior Fellow; Antonia Riedel, Researcher; Christoph Heinrich, Director, **Ecologic Institute, DE**

Martina Vijver, Scientific Director and Professor of Ecotoxicology, **Department of Environmental Biology, Leiden University, NL**

Bastiaan R. Bloem, MD, PhD, FRCPE, FEAN, Director, **Radboud University medical Centre, Department of neurology, Centre of Expertise for Parkinson's Disease, NL**

Carsten Brühl, Professor, Team Leader Community Ecology and Ecotoxicology**, Institute for Environmental Sciences Landau, Technical University Kaiserslautern – Landau, DE**

Christian Huyghe, Deputy Scientific Director of Agriculture, **National Research Institute for Agriculture, Food, and the Environment (INRAE), FR**

Catherine Cibien, Former Director, **French National Committee for UNESCO's Man and the Biosphere Programme (MAB France)**

Fiorella Belpoggi, Emerita Scientific Director, **Ramazzini Institute and ISDE-Italia - International Society of Doctors for Environment, IT**

Violette Geissen, Professor, Coordinator SPRINT, **Wageningen University, NL**

Vera Silva, Researcher, Deputy Coordinator SPRINT, **Wageningen University, NL**

Paul van der Brink, Professor, Coordinator SYBERAC, **Wageningen University, NL**

Daniel Martins Figueiredo, Assistant Professor, **Utrecht University, NL**

Nico van der Brink, Professor, **Wageningen University, NL**

Ralf Schäfer, Professor, **Research Center for One Health, Research Alliance Ruhr, DE**

Marion Junghans, Group Leader Risk Assessment**, Swiss Centre for Applied Ecotoxicology, CH**

Dave Goulson, Professor of Ecology, **University of Sussex, UK**

Lieven Bervoets, Professor in Micropollutants, **Department of Biology, University of Antwerp, BE**

Guy Pe'er, Senior Researcher for Agroecology, **Helmholtz Centre for Environmental Research – UFZ and German Centre for integrative Biodiversity Research (iDiv) Jena-Halle-Leipzig, DE**

Patrick Santens, Professor, MD-PhD, **Ghent University Hospital, BE**

Daan Van Brusselen, Medical Professor Pediatrics, **University of Antwerp, BE**

Lut Arckens, Professor for Neurobiology, **KU Leuven, BE**

Hanns Moshammer, Professor for Environmental Health, **Medical University of Vienna, AT**

Matthias Liess, Professor for Ecotoxicology, Head of System-Ecotoxicology, **Helmholtz Centre for Environmental Research – UFZ, DE**

Andreas Focks, Professor, Director of Research Center for Environmental Systems Research, Professor, Environmental Risk Assessment of Chemicals, **University of Osnabrück, DE**

Wim Bert, Professor for Nematology, Head of the Nematology Research Unit, **Ghent University, BE**

Sara D. Leonhardt, Professor for Pollinator ecology, **Technical University of Munich, DE**

Pierre-Henri Gouyon, Professor for Genetics, Evolution and Biodiversity, **Muséum National d'Histoire Naturelle, FR**

Jean-Marc Bonmatin, Senior Researcher, Impacts of pesticides on environment, biodiversity and human health, **National Center for Scientific Research (CNRS), FR**

Jakub Hofman, Professor of Soil Ecotoxicology, **Masaryk University, Research Centre for Toxic Compounds in the Environment (RECETOX), CZ**

Johann Zaller, Professor of Ecotoxicology, **BOKU University, AT**

Cécile Chevrier, Senior Researcher, Pesticides and health, Exposure science and Epidemiology, **National Institute of Health and Medical Research (INSERM), FR**

Vivi Schlünssen, Department of Public Health, **Aarhus University, DK**

Julie Pannequin, Senior Researcher, **Institute of Functional Genomics, CNRS, FR**

Michiel Kraak, Professor for Aquatic Ecotoxicology, **UvA, NL**

Natalia Corcoll, Professor for Ecotoxicology, **University of Gothenburg, SE**

Anne Marie Cortesero, Professor for Ecology and genetics for Insects, **University of Rennes, FR**

Oliana Carnevali, Professor for Reproductive Toxicology, **Università Politecnica delle Marche, IT**

András Báldi, Professor of Ecology, **HUN-REN Centre for Ecological Research, HU**

Klara Hilscherova, Professor, **Masaryk University, RECETOX, CZ**

Lisa Melymuk, Professor, **Masaryk University, RECETOX, CZ**

Klára Šmídová, Researcher, **Masaryk University, RECETOX, CZ**

Lola Bajard, Researcher, **Masaryk University, RECETOX, CZ**

Eliska Sychrova, Researcher, **Masaryk University, RECETOX, CZ**

Marek Šudoma, Researcher, **Masaryk University, RECETOX, CZ**

Ondrej Adamovsky, Researcher, **Masaryk University, RECETOX, CZ**

Zuzana Toušová, Researcher, **Masaryk University, RECETOX, CZ**

Ludovic Mayer, Researcher, , **Masaryk University, RECETOX, CZ**

Philippe Grandcolas, Senior Researcher, **Institut Ecologie et Environnement du CNRS, FR**

Ole Faergeman, MD-PhD, **Professor Emeritus Preventive Cardiology, Aarhus University Hospital, DK**

Vyvyan Howard MD-PhD, **Emeritus Professor, Ulster University, UK**

Teja Tscharntke, Professor of Agroecology, **University of Göttingen, DE**

Wim van Saarloos, Professor Emeritus of Physics, **Leiden University, NL**

Marco Visser, Professor of Biodiversity and Ecosystems, **Leiden University, NL**

Geert R. de Snoo, Professor of Environmental Biology, **Leiden University, NL**

Henrik Barmentlo, Professor of Ecotoxicology (Ecology, Pesticides), Institute of Environmental Sciences, **Leiden University, NL**

Rémi Béranger, Professor of Environmental Epidemiology, **Université de Rennes, FR**

Michael Antoniou, Professor of Molecular Genetics and Toxicology, **King's College London, UK**

Marjolein Visser, Professor of Food Systems and Agroecology, **Université Libre de Bruxelles, BE**

Aurélie Berthet, Researcher in Toxicology, **University of Lausanne – Unisanté**, **CH**

Brian Wynne, Professor of Science Studies, Emeritus; Associate Director, UK ESRC Research Centre for Economic and Social Aspects of Genomics, **University of Lancaster, UK**

Joëlle Rüegg, Professor of Environmental Toxicology, **Uppsala University, SE**

Svetla Gateva, Associate Professor in Genotoxicity, **Institute of Biodiversity and Ecosystem Research, BG**

Giovanni Prete, Professor of Sociology, **Université Sorbonne Paris Nord, FR**

Jan Staes, Associate Professor of Hydrology, **University of Antwerp, BE**

Georg Petschenka, Professor, Institute of Phytomedicine, Department of Applied Entomology**, University of Hohenheim, DE**

Ondřej Košulič, Researcher, Department of Forest Protection and Wildlife Management, **Mendel University in Brno, CZ**

İme Akanyeti, Professor in Pesticide Pollution and Water Treatment, **Cyprus International University, CY**

Lucia Vergauwen, Professor of Ecotoxicology, **University of Antwerp, BE**

Mireille Sebbag, Researcher in Pesticide and Human Health, **Institut National de la Santé et de la Recherche Médicale, FR**

Dries Bonte, Professor, Terrestial Ecology Unit, **Ghent University, BE**

Luc Lens, Professor of Ecology, **Ghent University, BE**

Marc Kochzius, Professor of Marine Ecology, **Vrije Universiteit Brussel (VUB), BE**

Julia Osterman, Researcher in Pollinator Conservation, **University of Gothenburg, SE**

Ingela Dahllöf, Professor in Community Ecotoxicology, **University of Gothenburg, SE**

Jenny Egardt in Marine Ecotoxicology, Researcher, **University of Gothenburg, SE**

Bethanie Carney Almroth, Professor of Ecotoxicology, **University of Gothenburg, SE**

Polyxeni Nicolopoulou Stamati, Professor Environmental Pathology, **ENSSER, GR**

Dimitry Wintermantel, Professor of Nature Conservation & Landscape Ecology, **University of Freiburg, DE**

Gabriel Sigmund, Professor in Organic Contaminants, **Wageningen University, NL**

Marlene Ågerstrand, Associate Professor in Chemical Management, **Department of Environmental Science, SE**

Peter Batary, Professor of Ecology, **HUN-REN Centre for Ecological Research, HU**

Franky Bossuyt, Professor of Agroecology, **Vrije Universiteit Brussel, BE**

Myriam Dumortier, Professor of Agroecology, **Ghent University, BE**

Colette Bertrand, Researcher, **National Institute for Agriculture, Food and Environment (INRAE), FR**

Ivan Janssens, Professor of Global Change Ecology, **University of Antwerp, BE**

Florence VOLAIRE, Researcher in Ecology, **Univ Montpellier, FR**

Tom Breeze, Researcher in Biodiversity and Ecosystem Service, **University of Reading, UK**

Olivier Crouzet, Researcher in Biodiversity and Ecotoxicology, **French Agency for Biodiversity (OFB), FR**

Frederik Verbruggen, Professor of Cognitive Ecology, **Ghent University, BE**

Thomas Merckx, Professor of Global Change Biology, **Vrije Universiteit Brussel, BE**

Darragh Doyle, Researcher in Physiology, **Gothenburg University, SE**

Marc Voltz, Researcher in Pesticide Fate in the Environment, **INRAE, FR**

Lars Förlin, Professor of Ecotoxicology, **University of Gothenburg, SE**

Simone Tosi, Professor of Environmental Health, **University of Turin, IT**

Stanislas Rigal, Researcher in Biodiversity, **Foundation for Biodiversity Research, FR**

Jakob Wolfram, Researcher in Ecotoxicology, **RPTU Kaiserslautern-Landau, DE**

Larissa Mies Bombardi, Researcher in Agriculture, **Université Libre de Bruxelles, BE**

Agossè Nadège Degbelo, Researcher in Environmental Health, **INRAE, FR**

Angelika Hilbeck, Retired Senior Researcher on Environmental Biosafety and Agroecology, **Swiss Federal Institute of Technology, CH**

Bonnie Bérangère Bailet, Researcher on Ecology and Conservation of Aquatic Ecosystems, **INRAE, France, FR**

Thomas Potthast, Professor of Ethics and Philosophy of Science, University **of Tübingen, DE**

Joffrey Moiroux, Researcher and Lecturer on Entomology, **Avignon Université, FR**

Liesbet Temmerman, Professor for Molecular and Functional Neurobiology, **KU Leuven, BE**

Olivier Jolliet, Professor for Life Cycle Impact Assessment, **Technical University Denmark, DK**

Pierre-François Staub, Scientific Officer on Pollution and Biodiversity, **French Biodiversity Agency, FR**

Ingo Grass, Professor on Agroecology, **University of Hohenheim, GE**

Denis Paillard, Researcher on Environment-Host-Pathogen Interactions, **CNRS, FR**

Nelson Abrantes, Researcher on Ecotoxicology and Ecological Risk Assessment, **Aveiro University, PT**

Santiago Gonzalez-Martinez, Senior Researcher on Forestry, **INRAE, FR**

Erik Millstone, Professor for Food Safety Policy, **University of Sussex, UK**

Konstantinos Makris, Professor in Pesticides and Children's Health, **Cyprus University of Technology, CY**

Christophe Plomion, Senior Researcher in Genetics, **INRAE, FR**

Pierre Sujobert, Professor for Hematology, **Lyon 1 University – Hospices Civils de Lyon, FR**

Gérard Socié, Professor for Hematology, **INSERM, FR**

Franck Gilbert, Senior researcher, Ecology, **CNRS, FR**

Servane Lemauviel-Lavenant, Professor for Ecology, **Université de Caen Normandie, FR**

François-Marie Martin, Professor of Ecology, **University Grenoble Alpes, FR**

Prof. Pierrick Labbé, Professor for Ecology and Evolution, **Université de Montpellier, FR**

Benoît Fontaine, Researcher in Conservation Biology, **Muséum National d'Histoire naturelle, FR**

Maxime Cailleret, Researcher in Plant Ecology, **INRAE, FR**

Pierre Jay-Robert, Professor for Ecology, **Université de Montpellier Paul Valéry, FR**

Bertrand Isidor, Doctor for Medical Genetics, **CHU Nantes**, **FR**

Julie Deter, Associate Professor Emerging Zoonotic Diseases and Marine Ecology, **Andromède océanologie, FR**

Bernard Riera, Professor Forest Ecology and Botanics, **Muséum National d'Histoire Naturelle, FR**

Valérie D'Acremont, Professor for Global and environmental Health, **University of Lausanne, CH**

Frederic Revers, Researcher, Ecology, **INRAE, FR**

Alex Ford, Professor for Ecotoxicology, **University of Portsmouth, UK**

Legay Nicolas, Associate Professor Agroecology, **CNRS / INSA Centre Val de Loire, FR**

Dirk Schmeller, Senior Researcher, **CNRS, FR**

Robert Paxton, Professor for Insect Evolutionary Ecology, **Martin Luther University Halle-Wittenberg, DE**

Quentin Lambert, Assistant Professor of Functional Ecology, **UMR EVA, FR**

Olivier Plantard, Senior Researcher Parasitology, **INRAE, FR**

Martin Quentel, Medical Doctor, **Université de Bordeaux, FR**

Isabelle Gounand, Researcher in Ecology, **CNRS, FR**

Mariana Simões, Researcher on Environmental Epidemiology, **Utrecht University, NL**

Matteo Campioli, Professor of Plant Ecology, **University of Antwerp, BE**

Manuel E. Ortiz Santaliestra, Professor for Ecotoxicology, **Institute for Game and Wildlife Research (IREC) UCLM-CSIC-JCCM, ES**

Eric Petit, Researcher in Ecology, **INRAE, FR**

Marion Boisseaux, Researcher in Ecology, **CNRS, FR**

Chalvet-Monfray, Professor for Epidemiology of Animal and Zoonotic Diseases, **INRAE**, **FR**

Fabrice VAVRE, Senior Researcher on Biological Evolution, **CNRS**, **FR**

Eric Solary, Professor for Hematology, **Université Paris-Saclay**, **FR**

Tricaud Jérôme, Research Engineer, **Université de Bordeaux**, **FR**

Beryl Laitung, Professor for Ecology and Life Sciences, **Université Bourgogne Europe**, **FR**

Maxime Réjou-Méchain, Senior Researcher, **IRD, FR**

Jacques Baudry, Researcher, Landscape ecology, crop management, natural pest control, **INRAE, FR**

Annette Morvan-Bertrand, Professor in Plant Physiology, **Université de Caen Normandie, FR**

Jean-Christophe Clement, Professor for Ecosystem functioning, **Université Savoie Mont Blanc**, **FR**

Vincent Devictor, Senior Researcher, **CNRS**, **FR**

Filip Volckaert, Professor for Biological Oceanography, **KU Leuven**, **BE**

Florence Hulot, Associate Professor, **Paris-Saclay University**, **FR**

Moritz Hunsmann, Researcher Ecology and Health, Occupational and Environmental cancer/Pesticides, **CNRS, FR**

Jessica Dittmer, Researcher on Microbial ecology, **INRAE**, **FR**

Fontaine Colin, Researcher, **CNRS**, **FR**

Janne Swaegers, Post-doctoral Researcher, **KU Leuven**, **NL**

Bouchema Inès, Post-doctoral Researcher, **Université de Poitiers, FR**

Elsa Jourdain, Senior Researcher, **INRAE**, **FR**

Samantha Fevrier, Coordinator SPIPOLL, **Université de Bordeaux**, **FR**

Ludovic Duvaux, Research Engineer, **INRAE**, **FR**

Julien Foucaud, Research Engineer, **INRAE**, **FR**

Annelise Liabot, Project Manager for Biological Safety, **INRAE, FR**

Jan Buellesbach, Professor Evolutionary Chemical Ecology, **Technical University of Munich**, **DE**

Manuel Curto, Senior Researcher, **BOKU University, AT**

Jean-Bernard Cliquet, Professor for Plant Ecophysiology, **Université de Caen, FR**

Cedric Gaucherel, Researcher, **INRAE, FR**

Noémie Pichon, Researcher, **Swiss Federal Research Institute WSL, CHE**

Lisa Jaquin, Professor for Ecotoxicology, **Université de Toulouse, FR**

Caroline Zandecki, Post-doctoral Researcher, **KU Leuven, BE**

Hugo Gante, Assistant Professor for Biology, **KU Leuven, BE**

Adam Vanbergen, Senior Researcher, **INRAE, FR**

Romain Bertrand, Professor of Global Change Biology, **CNRS, FR**

Francois Pompanon, Professor, **University Grenoble Alpes, FR**

Eve Davidian, Post-doctoral Researcher, **CNRS, FR**

Laurence Huc, Senior Researcher, Group Leader Contaminants & Cellular Stress, **INRAE, FR**

Virginie Cuvillier, Associate Professor Ecotoxicology, **Université de Lille, FR**

Anne Charmantier, Professor for Evolutionary Ecology, **CNRS, FR**

Josephine Pithon, Professor for Agronomy and Ecology, **Ecole Supérieure des Agricultures d'Angers, FR**

Thibaud Monnin, Senior Researcher, **CNRS, FR**

Jean-Louis Hemptinne, Professor for Evolution & Biodiversity, **Université de Toulouse, FR**

Gerard Duvallet, Professor Emeritus for Medical Entomology, **University Paul-Valery Montpellier, FR**

Marta Lombó, Post-doctoral Researcher, **Università Politecnica delle Marche, IT**

Farruggia Aurélia, Researcher, **University of Caen, FR**

Annika Jahnke, Professor for Environmental Chemistry, **Helmholtz-Centre for Environmental Research - UFZ, GER**

Marc Deconchat, Senior Researcher, **INRAE, FR**

Mirco Bundschuh, Professor for Ecotoxicology, **RPTU University Kaiserslautern-Landau, GER**

Christine Lauzeral, Researcher, **CRBE, Université Toulouse, FR**

Anatja Samouelian, Researcher, **INRAE, FR**

Pierre Benoit, Senior Researcher, **INRAE, FR**

Anamaria Necsulea, Senior Researcher, **CNRS, FR**

Carole Bedos, Senior Researcher on Volatilization of pesticides, **INRAE, FR**

Xavier Morin, Senior Researcher in Plant Diversity, **CNRS, FR**

Armin Bischoff, Professor for Agroecology, **Avignon University, UMR IMBE, FR**

Robin Mesnage, Researcher in Dietary Exposure to Pesticides, **King's College London, UK**

Élisabeth Lambert, Research in Environmental Law, **CNRS, FR**

Dominique Adriaens, Professor in Evolution, **Ghent University, BE**

Birgit Müller, Professor of Political and Environmental Anthropology, **CNRS/EHESS, FR**

Anne-Sophi Denolle, Senior Lecturer in Law, Université de Rouen Normandie, FR

Nidal Shaban, Professor, **University of Forestry, BG**

Antoine Maclouf, MD, **General Medical Doctor, FR**

Michel CAMPANO, MD**, General Medical Doctor, FR**

Michel Nicolle, MD, **General Medical Doctor, FR**

Annex: key recommendations for strengthening pesticide risk assessment

#1) Strengthen the feedback of the best and latest available science to the (re)authorisation or withdrawal of all active substances and pesticide products. This includes independent and current science, emerging topics such as neurotoxicity, monitoring results, and population-wide health outcomes.

Context: Risks from long-term and chronic pesticide exposure are difficult to detect in pre-market testing and often become evident only once a pesticide is in widespread use[25]. The pesticide assessment system systematically privileges industry studies while sidelining independent, peer-reviewed science. By treating Good Laboratory Practice (GLP) as the primary marker of credibility—despite GLP being a documentation standard rather than a measure of scientific validity—regulators routinely discount newer, independent academic research, narrowing the scientific base of assessments and obscuring emerging risks.[26]

#2) Better assess the acute and chronic toxicity of realistic pesticide mixtures encountered by humans and exposed wildlife, instead of just individual substances, by testing recommended tank mixes, spray series and common mixtures found in the environment.

Context: Pesticides are currently assessed on a substance-by-substance basis, but mixtures of pesticides are widespread in the environment in soils, air, water, vegetation, crops, food, animals, humans and in indoor dust.[27] Insects and other organisms are chronically exposed year-round to landscape-scale pesticide mixtures, while the regulatory risk assessment mainly accounts for acute exposures for a single spraying event[28]. Realistic mixtures of pesticides have been found to adversely affect soil and aquatic organisms, even when levels of individual substances were considered safe through regulatory assessment[29]. Even planned mixtures such as recommended tank mixes are not consistently evaluated for safety[30], and application sequences are not addressed at all[31]. Models used in current regulations do not reliably predict how pesticides will travel and degrade in the environment, with a recent study showing poor correlation between predicted environmental concentrations in soil (PEC) and concentrations measured in the environment (MEC)[32].

#3) Include more realistic and sensitive toxicity tests in pre-market evaluations. All pesticides need to be tested for neurotoxicity, including developmental neurotoxicity, target toxicity for more human organs and ecotoxicological impacts on more sensitive species, rather than only standard test organisms. More standardised mesocosm and ecosystem tests could add realism to the environmental assessment.

Context: Required pre-market toxicity testing on limited standard tests on human and ecological toxicology, which are often not sufficiently sensitive to detect pesticide toxicity in the real world. [33] In laboratory tests using alternative sensitive species, sensitive ecological indicators, and new human organ tests, pesticides were shown to have detrimental effects not detected in regulatory assessment.[34]

#4) Require more thorough assessments of human exposure to pesticides, better accounting for pesticides humans encounter in the environment or near fields. We urgently need to include the long-term health effects of low-dose exposure to pesticide mixtures, especially during sensitive early life stages.

Context: The current regulation focuses mainly on human pesticide exposure through food intake, whereas pesticides in the environment can also significantly contribute to overall human pesticide exposure, e.g., through inhalation, dermal contact or ingestion[35]. Farmers and their neighbors can be exposed to spraying from multiple farms in the same vicinity.[36]

#5) Introduce Human Biomonitoring Programs to support detection of human exposures for all sources and routes of uptake. When active substances are approved, **Biological Guidance Values (BGV)** should be set, which define safe levels of active substance in human samples (e.g., blood, urine), supporting human biomonitoring.

Context: human biomonitoring directly measures internal exposure by detecting pesticide metabolites in biological samples (urine, blood, hair), and has successfully detected risks from a range of chemical exposures, and a recent human biomonitoring study found that 84% of sampled children and adults carried residues of two or more pesticides.[37] The Netherlands has endorsed the use of BGVs to support human biomonitoring[38], while the EU pesticide regulation only recognises acceptable dietary intake (ADI) as a measure of human exposure.

#6) Include stronger safety margins for allowable pesticide exposures to account for critical missing data and exposure to mixtures in food and the environment.

Context: Scientific knowledge gaps and critical missing data undermine the certainty of pre-market risk assessment, especially for effects on children, pregnancy and fertility. There is critical missing knowledge in how pesticides are processed in the human body[39] and in emerging topics like gut microbiome research. Allowable exposure limits can be lowered where data is missing.

#7) Require mandatory digital registration of all pesticides applied on fields, including biocontrol products and agents, so that spatial pesticide usage data at high resolution per crop type are readily available and allow for systematic **detection of risk and exposure patterns**.

Context: Data availability of pesticide use is absolutely key for research, exposure and impact assessments, as well as for management and policy decisions, but only a few Member States have complete digital registries of use. In addition to monitoring the use of synthetic pesticides, possible risks for biocontrol products, such as insects and viruses, must also be closely followed through digital registrations.

#8) Withdraw the approval for particularly harmful pesticides, such as candidates for substitution, PFAS pesticides, co-formulants and pesticides degrading into particularly harmful metabolites, as well as other pesticides proven or strongly indicated to be particularly harmful (carcinogens, mutagens, toxic for reproduction, endocrine disruptors, neurotoxic, persistent, bioaccumulative and toxic (PBT), very persistent, and very mobile (vPvM), very persistent and very bioaccumulative (vPvB). There **should not be a grace period for use after withdrawal**, reflecting appropriate precaution for environmental and human health.

Endnotes

1. CJEU Case C-308/22 (2024). Pesticide Action Network Europe (PAN Europe) v College voor de toelating van gewasbeschermingsmiddelen en biociden
2. National Research Council (2009). Science and Decisions: Advancing Risk Assessment. Washington, DC: The National Academies Press., Myers et al. (2009). A Clash of Old and New Scientific Concepts in Toxicity, with Important Implications for Public Health
3. Vijver et al. (2017). Postregistration monitoring of pesticides is urgently required to protect ecosystems, EEA (2013). Late lessons from early warnings: science, precaution, innovation, EFSA (2018). Peer review of the pesticide risk assessment for bees for the active substance clothianidin considering the uses as seed treatments and granules, EFSA (2019). Updated statement on the available outcomes of the human health assessment in the context of the pesticides peer review of the active substance chlorpyrifos-methyl, Wolejko et al. (2022). Chlorpyrifos Occurrence and Toxicological Risk Assessment: A Review, EFSA (2020). Peer review of the pesticide risk assessment of the active substance benalaxyl
4. Spycher et al. (2024). Linking chemical surface water monitoring and pesticide regulation in selected European countries, European Court of Auditors (2020). Sustainable use of plant protection products: limited progress in measuring and reducing risks, SAPEA, Science Advice for Policy by European Academies. (2018). Improving authorisation processes for plant protection products in Europe
5. CJEU Case C-308/22 (2024). Pesticide Action Network Europe (PAN Europe) v College voor de toelating van gewasbeschermingsmiddelen en biociden
6. Borgert et al. (2016). Does GLP enhance the quality of toxicological evidence for regulatory decisions?, Robinson et al. (2020). Achieving a High Level of Protection from Pesticides in Europe: Problems with the Current Risk Assessment Procedure and Solutions, Trasande et al. (2016). Peer-reviewed and unbiased research, rather than 'sound science', should be used to evaluate endocrine-disrupting chemicals.
7. Abrantes et al. (2024). Towards a comprehensive methodology for ecotoxicological assessment: Prioritizing plant protection products for mixture testing in edge-of-field surface waterbodies, Abrantes et al. (2024). Ecotoxicological Assessment of Pesticide Mixtures on Aquatic Non-Target Species (Deliverable Report D4.2), Tourinho et al. (2024). Ecotoxicological Assessment of Pesticide Mixtures on Terrestrial Non-Target Species (Deliverable Report D4.1)
8. Silva et al. (2023). Pesticide residues with hazard classifications relevant to non-target species including humans are omnipresent in the environment and farmer residences
9. Abrantes et al. (2024). Towards a comprehensive methodology for ecotoxicological assessment: Prioritizing plant protection products for mixture testing in edge-of-field surface waterbodies, Abrantes et al. (2024). Ecotoxicological Assessment of Pesticide Mixtures on Aquatic Non-Target Species (Deliverable Report D4.2), Tourinho et al. (2024). Ecotoxicological Assessment of Pesticide Mixtures on Terrestrial Non-Target Species (Deliverable Report D4.1)
10. Beketov et al. (2013). Pesticides reduce regional biodiversity of stream invertebrates, Mesnage et al. (2020). Computational modelling provides insight into the effects of glyphosate on the shikimate pathway in the human gut microbiome, Abrantes et al. (2024). Ecotoxicological Assessment of Pesticide Mixtures on Aquatic Non-Target Species (Deliverable Report D4.2), Tourinho et al. (2024). Ecotoxicological Assessment of Pesticide Mixtures on Terrestrial Non-Target Species (Deliverable Report D4.1), Mandrioli et al. (2025). Assessment of the effects of PPPs' mixtures on animal health (Deliverable Report 4.5)
11. Figueiredo et al. (2025). Integrated Exposure Estimates Including a Sensitivity Analysis for Each of the PPPs' Mixtures for C-I-O Farming Scenarios and Information on Expected Variability in These Exposure Estimates (Deliverable Report No. D3.5), Figueiredo et al. (2025). Non-dietary personal pesticide exposure using silicone wristbands across 10 European countries
12. Pelkonen et al. (2023). Metabolites in the regulatory risk assessment of pesticides in the EU, Grech et al. (2017). Toxicokinetic models and related tools in environmental risk assessment of chemicals,
13. Silva et al. (2023). Pesticide residues with hazard classifications relevant to non-target species including humans are omnipresent in the environment and farmer residences
14. Wan et al. (2025). Pesticides have negative effects on non-target organisms, Seibold et al. (2019). Arthropod decline in grasslands and forests is associated with landscape-level drivers, Brühl et al. (2024). Widespread contamination of soils and vegetation with current use pesticide residues along altitudinal gradients in a European Alpine valley, EEA (2023). How pesticides impact human health and ecosystems in Europe, Brühl et al. (2021). Direct pesticide exposure of insects in nature conservation areas in Germany, Honert, Mauser, Jäger, & Brühl (2025). Exposure of insects to current use pesticide residues in soil and vegetation along spatial and temporal distribution in agricultural sites, Mauser et al. (2025). Current-use pesticides in vegetation, topsoil and water reveal contaminated landscapes of the Upper Rhine Valley, Germany, Hallmann et al. (2017). More than 75 percent decline over 27 years in total flying insect biomass in protected areas
15. Rigal et al. (2023). Farmland practices are driving bird population decline across Europe
16. Beaumelle et al. (2023). Pesticide effects on soil fauna communities - A meta-analysis, Gunstone et al. (2021). Pesticides and Soil Invertebrates: A Hazard Assessment
17. Mamy et al. (2022) Impacts des produits phytopharmaceutiques sur la biodiversité et les services écosystémiques — rapport de l'expertise scientifique collective, INRAE and Ifremer, Pisa et al. (2021). An update of the Worldwide Integrated Assessment (WIA) on systemic insecticides. Part 2: impacts on organisms and ecosystem, Eidels et al. (2016), Sub-lethal effects of chlorpyrifos on big brown bats (Eptesicus fuscus), Ullah et al. (2018). Cypermethrin induced toxicities in fish and adverse health outcomes: its prevention and control measure adaptation
18. Inserm (2021). Collective Expert Review on the Health Effects of Pesticides, EEA, 2023: How pesticides impact human health and ecosystems in Europe, Kim et al. (2017). Exposure to pesticides and the associated human health effects, Panzachi et al. (2025). Carcinogenic effects of long-term exposure from prenatal life to glyphosate and glyphosate-based herbicides in Sprague–Dawley rats
19. Cavalier et al. (2022). Exposures to pesticides and risk of cancer: Evaluation of recent epidemiological evidence in humans and paths forward, Vinson et al. (2011). Exposure to pesticides and risk of childhood cancer: A meta-analysis of recent epidemiological studies
20. EU citizens are not protected against neurotoxic effects of pesticides, Pesticides play role in Parkinson's explosion, says Dutch expert, Bloem and Boonstra, (2023). The inadequacy of current pesticide regulations for protecting brain health: the case of glyphosate and Parkinson's disease, Matsuzaki et al. (2023).Pesticide exposure and the microbiota-gut-brain axis, Diwan et al. (2023). Impact of Pesticide Residues on the Gut-Microbiota-Blood–Brain Barrier Axis: A Narrative Review, Gama et al. (2022). Chronic Effects of Dietary Pesticides on the Gut Microbiome and Neurodevelopment

21. Román et al. (2024). Exposure to Environmental Pesticides and the Risk of Autism Spectrum Disorders: A Population-Based Case-Control Study, Mowafi et al. (2025). Toxic sprays, fragile brains: assessing pesticides exposure and disparities on neurodevelopment, James & OShaughnessy. (2023). Environmental chemical exposures and mental health outcomes in children: A narrative review of recent literature
22. Albadrani et al. (2024). Pesticide exposure and spontaneous abortion risk: A comprehensive systematic review and meta-analysis. Chiu et al. (2018). Association Between Pesticide Residue Intake From Consumption of Fruits and Vegetables and Pregnancy Outcomes Among Women Undergoing Infertility Treatment With Assisted Reproductive Technology
23. Matsuzaki et al. (2023). Pesticide exposure and the microbiota-gut-brain axis, Puigbò et al. (2022). Does Glyphosate Affect the Human Microbiota?, Lehman et al. (2023). Low-dose glyphosate exposure alters gut microbiota composition and modulates gut homeostasis, Motta et al. (2018). Glyphosate perturbs the gut microbiota of honey bees, Mandrioli et al. (2025). Assessment of the Effects of Pesticides Mixtures on Human Health (Deliverable Report D4.5)
24. Kab et al. (2017). Agricultural activities and the incidence of Parkinson's disease in the general French population
25. National Research Council (2009). Science and Decisions: Advancing Risk Assessment. Washington, DC: The National Academies Press., Myers et al. (2009). A Clash of Old and New Scientific Concepts in Toxicity, with Important Implications for Public Health
26. Borgert et al. (2016). Does GLP enhance the quality of toxicological evidence for regulatory decisions?, Robinson et al. (2020). Achieving a High Level of Protection from Pesticides in Europe: Problems with the Current Risk Assessment Procedure and Solutions, Trasande et al. (2016). Peer-reviewed and unbiased research, rather than 'sound science', should be used to evaluate endocrine-disrupting chemicals.
27. Silva et al. (2023). Pesticide residues with hazard classifications relevant to non-target species including humans are omnipresent in the environment and farmer residences
28. Honert, Mauser, Jäger, & Brühl (2025). Exposure of insects to current use pesticide residues in soil and vegetation along spatial and temporal distribution in agricultural sites, Mauser et al. (2025). Current-use pesticides in vegetation, topsoil and water reveal contaminated landscapes of the Upper Rhine Valley, Germany
29. Abrantes et al. (2024). Towards a comprehensive methodology for ecotoxicological assessment: Prioritizing plant protection products for mixture testing in edge-of-field surface waterbodies, Abrantes et al. (2024). Ecotoxicological Assessment of Pesticide Mixtures on Aquatic Non-Target Species (Deliverable Report D4.2), Tourinho et al. (2024). Ecotoxicological Assessment of Pesticide Mixtures on Terrestrial Non-Target Species (Deliverable Report D4.1)
30. Regulation (EC) No 1107/2009 concerning the placing of plant protection products on the market, Section 7.1.8
31. Brühl et al. (2019). Biodiversity Decline as a Consequence of an Inappropriate Environmental Risk Assessment of Pesticides
32. Knuth et al. (2024). Pesticide Residues in Organic and Conventional Agricultural Soils across Europe: Measured and Predicted Concentrations
33. Beketov et al. (2013). Pesticides reduce regional biodiversity of stream invertebrates, Mesnage et al. (2020). Computational modelling provides insight into the effects of glyphosate on the shikimate pathway in the human gut microbiome
34. Abrantes et al. (2024). Ecotoxicological Assessment of Pesticide Mixtures on Aquatic Non-Target Species (Deliverable Report D4.2), Tourinho et al. (2024). Ecotoxicological Assessment of Pesticide Mixtures on Terrestrial Non-Target Species (Deliverable Report D4.1), Mandrioli et al. (2025). Assessment of the effects of PPPs' mixtures on animal health (Deliverable Report 4.5)
35. Figueiredo et al. (2025). Integrated Exposure Estimates Including a Sensitivity Analysis for Each of the PPPs' Mixtures for C-I-O Farming Scenarios and Information on Expected Variability in These Exposure Estimates (Deliverable Report No. D3.5), Figueiredo et al. (2025). Non-dietary personal pesticide exposure using silicone wristbands across 10 European countries
36. Debler et al. (2024). Occurrence and distribution of pesticides and transformation products in ambient air in two European agricultural areas, Figueiredo et al. (2025). Spatio-temporal variation of outdoor and indoor pesticide air concentrations in homes near agricultural fields,
37. EEA (2025). Risks of chemical mixtures for human health in Europe (Signal),
38. Health Council of the Netherlands. (2025). Assessment framework for biological limit values.
39. Pelkonen et al. (2023). Metabolites in the regulatory risk assessment of pesticides in the EU, Grech et al. (2017). Toxicokinetic models and related tools in environmental risk assessment of chemicals,