MANIFESTO - Protecting Arthropods: A call for urgent reform in EU pesticide regulation

PAN Europe

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They are tiny, but they make life possible. Non-target arthropods (NTAs)—butterflies, beetles, spiders, and countless other invertebrates—are the silent workforce keeping European agriculture and ecosystems alive. Often overlooked as mere "bugs," these creatures pollinate our crops, keep our soils rich and healthy, keep harmful pests in check and provide food to countless animals—all for free. Without them, food production would plummet, ecosystems would unravel, and the cost of farming would skyrocket.

The alarming reality? This workforce is collapsing. In just 25 years, Europe has lost a staggering 75% of its insect biomass, even in protected areas. This is not just an ecological tragedy—it's a direct and growing threat to agriculture. Fewer pollinators mean lower yields. Weakened natural pest control leads to heavier dependence on pesticides. Degraded soils threaten the very foundation of food production and water retention and purification. **If arthropods disappear, so does the future of European farming—and life on Earth as we know it.**

The good news is, there is a clear path to stop the bug collapse.

The root cause: a broken regulatory system

This crisis is not a natural phenomenon; it is a direct consequence of industrial agriculture, with pesticide use as a major cause. The EU Pesticide Regulation is supposed to prevent unacceptable harm to biodiversity, including to essential insect populations. So why are they disappearing at such a catastrophic rate?

The answer lies in a single, outdated, and deeply flawed document: the **2002 Guidance Document on Terrestrial Ecotoxicology[1],** specifically in Section 5 on non-target arthropods (NTA). For over two decades, this framework—used by EU Member States and the European Food Safety Authority (EFSA) to assess the risk posed by pesticides on arthropods—has systematically failed to protect NTAs. This is no accident. With industry employees taking part in its writing, **the guidance sets protection standards so low they are effectively meaningless.** It allows pesticides to be approved even if they cause up to **100% mortality** in tested insects—on assumptions that populations will "recover." It ignores the real-world impact of pesticide mixtures, chronic exposure, and the cumulative effects of widespread pesticide use. It only looks at individual pesticides and not at the cocktail that nature is exposed to on an almost constant level.

The result? A **regulatory loophole** that has enabled the collapse of bug biodiversity. This system is not just inadequate: it is unacceptable and illegal.

A once-in-a-generation opportunity…

[1] European Commission (2002). Guidance Document on Terrestrial Ecotoxicology Under Council Directive 91/414/EEC, p.19-24. https://food.ec.europa.eu/document/download/424e71a2-5beb-4fa3-9198-89be916c1789_en?filename=pesticides_ppp_app-proc_guide_ecotox_terrestrial.pdf.

But change is finally within reach. The guidelines are being rewritten. In June 2024, after years of warnings by scientists and EU Member States, the European Commission tasked EFSA with updating this document. The Authority has begun revising this outdated guidance, after naming the group of experts to define the new methodologies and protection standards.

The revision of the NTA guidance document presents a rare and urgent opportunity to correct decades of regulatory failure.

This is a once-in-a-generation opportunity to secure real protection for the biggest chunk of biodiversity. If we act now, we can ensure that the new guideline is rid of its previous shortcomings and sets the right safeguards for the insects that sustain our ecosystems and food supply.

…or an upcoming regulatory failure?

The revision is meant to bring stronger biodiversity protection against harmful pesticides. However, there are serious indications that it might not result in stronger protection standards but instead reinforce the status quo.

PAN Europe raises **serious doubts** about whether the revision will bring meaningful change—or simply rubber-stamp EFSA's flawed preparatory work. A recent investigation by PAN Europe has exposed that EFSA's approach—developed in collaboration with Wageningen University—fails to introduce meaningful improvements and continues to prioritise industry interests over scientific integrity. Alarmingly, EFSA's proposal ignores the risks posed by pesticide mixtures, protects only a handful of species that generate "ecosystem services for humans" (centred on human interests only), and offers no real safeguards for biodiversity in the field. It effectively disqualifies entire groups of essential arthropods considered as a "disservice"—such as grasshoppers, mites, thrips, and thousands of other species[2]— thus dealing a severe blow to agriculture itself. If only a fraction of the ecosystem is protected, the stability and resilience of the entire system will be endangered.

Concerns are mounting over whether EFSA's hand-picked experts have the independence and expertise to deliver real reform. Notably, only 3 out of 11 members (27%) are active ecotoxicologists, and not a single real entomologist is included—despite the guidance being about the impact of pesticides on insects and other invertebrates. Six members (55%) have no direct expertise in the field, their main qualification being their employment by national pesticide regulators.

If the working group uncritically endorses EFSA's preparatory work, the outcome will be predictable: the updated guidance document **will maintain existent shortcomings from the current guidance document and new controversial concepts will further undermine NTA protection.**

Our proposals for a successful protection of nature's workforce, the arthropods:

The future of European biodiversity is at stake. If EFSA fails to deliver a guidance document that truly protects arthropods, we will continue to see the catastrophic decline of these essential species. With **biodiversity in crisis**, the EU **cannot afford a failed revision**.

1. **Strengthen protection standards**
    - The new guidance must include the assessment of chronic, behavioural, and indirect effects on arthropods. Current testing focuses only on short-term mortality, ignoring long-term harm, behavioural disruptions, and ecosystem-level impacts, such as food web alterations.
    - The new guidance must set protection standards ensuring that pesticides do not cause unacceptable harm to arthropod populations and biodiversity. The current arbitrary 50%-100% mortality threshold must be urgently replaced with a stringent protection standard based on rigorous scientific research. Pesticides that result in significant mortality or other negative effects should not be deemed acceptable, as they pose a high risk to ecosystem health.

[2] See PAN Europe. (2024). *Licence to kill: an EU Guideline with far-reaching consequences.* URL: https://www.pan-europe.info/sites/pan-europe.info/files/public/resources/reports/November%20report%20-%20%27Licence%20to%20Kill%20-%20an%20EU%20guideline%20with%20far-reaching%20consequences%27.pdf

2. **Assessment must go beyond a few model species**
   - The new guidance must require a broader range of species for pesticide toxicity assessment, across all key functional groups, including pollinators, predators, parasitoids, decomposers, detritivores, and scavengers. Species selection must be scientifically driven, prioritising the most sensitive species within each group to ensure risk assessments reflect worst-case scenarios and protect the most vulnerable or threatened organisms.
   - As an interim measure, the industry (pesticide companies) should be required to test all species from the current guidance document and report all findings, ensuring a more comprehensive risk assessment, as currently industry can choose which species to test.

3. **Stop the use of the 'recovery' concept**
   - The unscientific concept of "recovery" for NTA populations should be removed from the new guidance document. It fails to consider real-world ecological risks and disregards the long-term ecological damage caused by repeated mortalities in insect populations.

4. **Exclude the "ecosystem services for humans" and "disservice" concepts from the new guidance document**
   - The new guidance should not include the concepts of "ecosystem services for humans" and "disservices," as they are unscientific and unlawful. They limit protection only to species that provide services to humans, especially for intensive agriculture, and exclude others by deeming them as a "disservice" to agricultural protection. They overlook the critical roles that all species play in maintaining ecological balance. This approach directly contradicts the EU Pesticide Regulation, which mandates the protection of biodiversity and ecosystems in their entirety (Regulation (EC) 1107/2009, Art. 4.3.e). Allowing these concepts in the new guidance would jeopardise biodiversity protection, threaten the resilience of ecosystems and the long-term sustainability of agricultural systems.

5. **Address real-world exposure**
   - The assessment must consider the cumulative effects of pesticide mixtures, repeated spraying, and exposure inside and outside of agricultural fields. On average, 10 pesticides are present in and around the field year-round[3]. The current one-chemical testing approach should be abandoned for it is gravely unscientific.

6. **Ensure scientific integrity**
   - The revision must be led by independent scientists, with relevant experience and expertise in ecotoxicology, entomology or biodiversity, with no ties or past collaborations with the pesticide industry.

7. **Adopt a system approach**
   - Stop the slow and flawed pesticide assessment process. The Commission should consider implementing a system-based approach[4], which provides a scientifically sound and applicable framework for protecting arthropods.

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[3] Honert, E., et al. (2025). Exposure of insects to current use pesticide residues in soil and vegetation along spatial and temporal distribution in agricultural sites. *Nature Scientific Reports, 15*(1), 1817. https://doi.org/10.1038/s41598-024-84811-4

[4] See for instance the work of Axelman, J., et al. (2024). A systems-based analysis to rethink the European environmental risk assessment of regulated chemicals using pesticides as a pilot case. *Science of The Total Environment, 948*, 174526. https://doi.org/10.1016/j.scitotenv.2024.174526