

REPORT: Water sampling confirms “closed” greenhouses leak an alarming number of pesticides

Sampling of rain and surface waters around greenhouses in Belgium, Netherlands, Spain and Germany shows contamination by an alarmingly high number of pesticides. This includes substances commonly used in greenhouses and even those outlawed years ago. The report, “[It rains pesticides from greenhouses!](#)” is published today by the Pesticides Action Network (PAN) Europe. It shows that greenhouses are not closed places and do not merit a less stringent regime when (re)approving pesticides.

Dozens of pesticides were detected in samples of rain and surface waters taken in areas where greenhouses were the only or predominant agricultural activity. As many as 35 different pesticides were detected in one rainwater sample from the Netherlands and 23 in a surface water sample from Spain. The number of pesticides detected was high in all four EU member states included in the snapshot sampling procedure, and included many prohibited substances.

While the concentrations of individual pesticides did not exceed national or European water standards, when available, their combined presence is cause for alarm. The study recorded combined concentrations of up to 90 µg/l in Belgian surface water and 21 µg/l in rainwater samples. This is 180 and 42 times more, respectively than the recently proposed 0.5 µg/l total pesticide threshold in surface water.¹

This is concerning because their toxicity in terms of mixture effects is not properly assessed under the EU pesticide safety/risk assessment procedure², despite legal requirements to account for cumulative - or additive, and synergistic - or magnifying effects.

The nature of these pesticides as well as their concentrations pose risks to ecosystems, biodiversity, and human health. Hans Muilerman, Chemicals Coordinator at PAN Europe, said: “The EU should urgently stop approving otherwise banned pesticides for use in greenhouses. Greenhouses are not closed and must be subject to an adequate pesticide risk assessment..”

The findings add to an already large body of evidence, dissected by this new report, that using greenhouses as a safeguarding measure against pesticides too toxic for approval in open fields - is unlawful and voids Pesticides Regulation (1107/2009) of its substance. The practice further violates the precautionary principle of the Treaty on the Functioning of the European Union (TFUE).

Yet, national and European authorities continue to assume that greenhouses are closed spaces preventing the release of pesticides into the environment, while the number of covered crop production systems continues to grow. “We find, time and again, that greenhouses are not closed systems. A ban on any pesticide must now mean that it’s banned from greenhouses, too,” said Manon Rouby, PAN Europe’s Policy Officer and Legal Adviser.

PAN Europe (Belgium), together with its members and partners: Ecologistas en Acción (Spain), PAN Germany (Germany), Natuur en Milieufederatie Zuid-Holland and PAN Netherlands (the Netherlands) collected surface and rainwater samples in two rounds, in April and in May/June 2023. The most frequently detected pesticides across the four countries were:

- Fluopyram, Flunisolid and Fluxapyroxad, all classified as PFAS⁴, were detected in the samples from all countries ;
- Boscalid, an endocrine disruptor, was also detected in rainwater samples across all four countries;
- Dimethomorph, an endocrine disruptor known to damage fertility, was detected in all countries included in the samples
- Metalaxyl-M, restricted to use only in greenhouses for treated seeds and associated with thyroid cancer, was detected in all countries except Germany;

Pesticide Action Network (PAN Europe) is a network of NGOs working to reduce the use of hazardous pesticides and have them replaced with ecologically sound alternatives. We work to eliminate dependency on chemical pesticides and to support safe sustainable pest control methods. Our network brings together over 45 consumer, public health and environmental organisations and women’s groups from across Europe.



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- 2,6-dichlorobenzamid, a metabolite of dichlobenil which is banned since 2008, was also detected in all countries included in the samples;
- Chlorpyrifos, the prohibited pesticide known to damage children's brain development at low doses, was detected in Belgium;
- Pendimethalin, of the "Ban Toxic 12 Now!" list⁵ - the 12 most toxic chemicals still approved in the EU that can cause cancer, heart disease, lead to birth defects, seriously harm the environment or a combination of these, was detected in Belgium and Germany;
- Diphenconazole, which can cause malformations in offspring, was detected in Germany, the Netherlands and Spain.

The rain and surface water samples were analysed for the presence of only 164 authorised and banned pesticides, while currently there are about 450 approved pesticides in the EU database. This sampling, therefore severely underestimated the reality. Its limited scope means that the real number and toxicity of pesticides emitted from greenhouses are even worse.

Our report unambiguously corroborates existing evidence that greenhouses are not closed systems, and is supported by research and analysis of national regulations conducted by PAN Europe members and partners in each of the four countries.

[Download the full report here.](#)

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Notes

1) Proposal for a Directive amending the Water Framework Directive, the Groundwater Directive and the Environmental Quality Standards Directive: https://environment.ec.europa.eu/publications/proposal-amending-water-directives_en

2) Pesticides Regulation 1107/2009 <https://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2009:309:0001:0050:en:PDF>

3) The EU Farm-to-Fork Strategy https://food.ec.europa.eu/horizontal-topics/farm-fork-strategy_en

4) New report exposes hidden threat: PFAS presence in pesticides: <https://www.pan-europe.info/press-releases/2023/11/new-report-exposes-hidden-threat-pfas-presence-pesticides>

5) Ban the Toxic 12 - now: <https://www.pan-europe.info/campaigns/ban-toxic-12>

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