

MEMORANDUM

Gesaan Untuk Kawal Selia Racun Perosak PFAS

Call for Regulatory Control of PFAS Pesticides

to / kepada

**Prime Minister of Malaysia
Ministry of Agriculture and Food Security
Ministry of Natural Resources and Environmental Sustainability
Members of the Pesticides Board**

submitted by



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RINGKASAN EKSEKUTIF

Bahan per- dan polifluoroalkil, yang lebih dikenali sebagai PFAS, merupakan bahan kimia yang bersifat berkekalan dalam persekitaran dan terbukti sangat toksik disebabkan oleh ikatan karbon-fluorin yang kuat. PFAS sering digunakan sebagai bahan aktif atau lengai dalam racun perosak kerana keupayaannya menghasilkan racun yang berkesan dan tahan lama dengan meningkatkan penyebaran serta kestabilan produk. Walau bagaimanapun, PFAS juga diketahui mengganggu proses biologi, terutamanya terhadap serangga, mikroba, dan spesies tumbuhan. Bahan ini turut menjejaskan kesihatan dan kesuburan tanah kerana sifatnya yang berkekalan serta kecenderungannya untuk terkumpul sehingga mencapai tahap kepekatan yang berbahaya. Kajian terkini secara konsisten membuktikan bahawa buah-buahan dan sayur-sayuran di United Kingdom tercemar dengan racun perosak PFAS. Pelabelan racun perosak PFAS yang telus jarang dilakukan, menyebabkan petani menyembur bahan kimia yang sangat toksik ini pada tanaman makanan mereka tanpa sedar. Pengambilan makanan yang tercemar dengan "Racun Perosak Kekal" (Forever Pesticides) ini memudaratkan kesihatan manusia; meningkatkan risiko kanser serta menjejaskan kesuburan dan sistem imun, selain menyebabkan komplikasi serius seperti penyakit kardiovaskular. Bagi kanak-kanak pula, pendedahan kepada PFAS didapati mengganggu perkembangan dan berpotensi membawa kesan kesihatan jangka panjang, termasuk penindasan sistem imun. Sifat PFAS yang berkekalan dalam persekitaran amat membimbangkan. Bahan kimia ini telah dikesan dalam tubuh haiwan di kawasan terpencil, malah kajian terhadap cecair tubuh manusia turut mengesahkan kehadirannya pada tahap yang boleh dikesan termasuk dalam susu ibu, yang menimbulkan kebimbangan serius. International Pollutants Elimination Network (IPEN) mengesyorkan penyingkiran PFAS, memandangkan sifatnya yang kekal lama dalam persekitaran serta risiko kesihatan yang serius. Setakat ini, berdasarkan kepada rujukan silang, terdapat 14 bahan aktif PFAS yang terkandung dalam 62 nama dagangan racun perosak berdaftar di Malaysia; namun, tiada data khusus yang menyenaraikan racun perosak sebagai pestisida PFAS dalam portal Jabatan Pertanian Malaysia. Demi beralih kepada kawalan perosak yang mampan dan mengutamakan kesihatan, Malaysia perlu mengenal pasti serta mengehadkan penggunaan PFAS dalam racun perosak secara ketat bagi mencegah penyebaran kesan buruknya. Selain itu, kajian dan pemantauan yang lebih meluas mengenai racun perosak PFAS perlu dijalankan, khususnya dari segi sifat ketahanannya serta potensi impak terhadap kesihatan dan alam sekitar. Akhir sekali, pengguna mempunyai hak asasi untuk mengetahui bahan kimia yang mereka hadapi, menjadikan pelaksanaan segera ketelusan penuh dalam pelabelan racun perosak PFAS satu keperluan penting.

EXECUTIVE SUMMARY

Per- and polyfluoroalkyl substances, more commonly known as PFAS, are long-term persistent chemicals that are proven to be highly toxic due to their strong carbon-fluorine bonds. PFAS are favoured as active or inert ingredients in pesticides due to their ability to make effective and long-lasting pesticides by enhancing dispersion and stability. However, on the flip side, PFAS are known biological process disruptors, especially towards insects, microbes and plant species. PFAS also affects the health and fertility of soil by being persistent and accumulating to harmful concentrations. Recent studies have continuously proven that fruits and vegetables in the United Kingdom are contaminated with PFAS pesticides. Transparent labelling of PFAS pesticides is uncommon, leading farmers to spray these highly toxic chemicals onto their food crops unknowingly. Ingestion of these “Forever Pesticides” is detrimental to human health, particularly elevating the risk of cancer as well as affecting fertility, immunity and causing severe complications such as cardiovascular diseases. In children, PFAS exposure is found to impair development and pose potential long-term health effects, including immunosuppression. The persistent nature of PFAS is worrisome, as this chemical has been found in the bodies of animals from remote areas and, in studies on human bodily fluids, it has been found at detectable levels, even in breast milk, providing cause for concern. International Pollutants Elimination Network (IPEN) strongly advocates for the elimination of PFAS, due to severe environmental persistence and health risks. From cross-referencing, we find that there are 14 PFAS active ingredients comprising 62 trade names of registered pesticides in Malaysia; however, there is no data available explicitly stating PFAS pesticides in the portal of the Department of Agriculture, Malaysia. Moving forward to sustainable and health-conscious pest control, Malaysia needs to identify and heavily restrict the use of PFAS in pesticides to prevent their harm from spreading. Besides, more extensive studies and monitoring on PFAS pesticides need to be conducted, especially in terms of their persistence and potential impact on health and the environment. Lastly, consumers have a fundamental right to know the chemicals they encounter, making the urgent implementation of full transparency in the labelling of PFAS pesticides essential.

1.0 INTRODUCTION

1.1 What is PFAS?

Per- and polyfluoroalkyl substances (PFAS), also known as “Forever Chemicals”, are a group of synthetic chemicals manufactured since the 1940s. Characterised by their strong carbon-fluorine bonds, PFAS are highly durable and resistant to degradation, making them a component in various industrial and consumer products.

One common characteristic of concern is that PFAS breaks down very slowly and can build up in people, animals, and the environment over time. According to the U.S. Environmental Protection Agency (EPA), two of the most widely used PFAS compounds are perfluorooctanoic acid (PFOA) and perfluorooctane sulfonate (PFOS) in the PFAS group. PFOA and PFOS have been replaced in the United States with other PFAS in recent years.¹

1.2 Why are PFAS used in pesticides?

PFAS can be intentionally added to pesticides for use as active or inert substances. PFAS can behave as dispersing agents to enhance pesticide effectiveness, as well as making pesticides more stable and prolonging their efficacy.²

Many PFAS in pesticides can directly disrupt biological processes, proving highly toxic towards insects, microbes and plant species. Research indicates that 'inert' substances in pesticides can be lethal to pollinators and, despite being understudied, are widespread in the environment.³ The insecticide lambda-cyhalothrin, which, in addition to being a ‘forever chemical’, is highly toxic to both humans and bees.⁴ Farmers are generally unaware that they are spraying ‘forever chemicals’ on their crops because there is no information on the label.

2.0 PFAS impact soil health

PFAS threaten the health and fertility of soil. PFAS have been shown to alter soil microbial communities⁵ and reduce the biodiversity and connectivity of soil bacteria⁶, all of which can impact crop yields.

PFAS can also interact with other chemicals to produce a ‘cocktail effect’. Mixtures of chemicals have been repeatedly shown to have greater adverse impacts than individual substances. Chemical cocktails have been found at more than 1,600 sites across England,

¹ US EPA. Our Current Understanding of the Human Health and Environmental Risks of PFAS <https://www.epa.gov/pfas/our-current-understanding-human-health-and-environmental-risks-pfas>

² PAN Europe et. Al. 2024, Toxic Harvest: The rise of forever pesticides in fruit and vegetables in Europe. In <https://fidra.org.uk/download/forever-chemicals-in-pesticides/>

³ Edward A. Straw, Linzi J. Thompson, Ellouise Leadbeater, Mark J. F. Brown; ‘Inert’ ingredients are understudied, potentially dangerous to bees and deserve more research attention. *Proc. R. Soc. B* 1 March 2022; 289 (1970): 20212353. <https://doi.org/10.1098/rspb.2021.2353>

⁴ ‘Forever chemicals’ found in UK food - Pesticide Action Network UK <https://www.pan-uk.org/pfas-forever-chemicals/>

⁵ Jian-yi Wu, Fu-ge Ding, Zhi-wei Shen, Zu-lin Hua, Li Gu, Linking microbiomes with per- and poly-fluoroalkyl substances (PFASs) in soil ecosystems: Microbial community assembly, stability, and trophic phylosymbiosis. *Chemosphere*, Volume 305, 2022, 135403, ISSN 0045-6535, <https://doi.org/10.1016/j.chemosphere.2022.135403>.

⁶ Cao L, Xu W, Wan Z, Li G, Zhang F. Occurrence of PFASs and its effect on soil bacteria at a fire-training area using PFOS-restricted aqueous film-forming foams. *iScience*, 2022; 25. <https://doi.org/10.1016/j.isci.2022.104084>

including combinations of four different types of PFAS (PFOS, PFOA, PFBS and PFHxS) and the pesticide 2,4-D⁷. These combinations have harmful effects on various species, including nitrogen-fixing bacteria, which are essential to soil health and plant growth.

Once in the environment, PFAS can spread and accumulate in groundwater, crops and living organisms, building to potentially harmful concentrations. The mobility and persistence of PFAS create additional burdens for soil monitoring, whilst the ability to clean up PFAS from contaminated soil is limited. Hence, the best approach is to prevent PFAS pollution at source, i.e. stop using PFAS pesticides.

3.0 PFAS found in food

Research has shown that fruits and vegetables in the United Kingdom and across the European Union are becoming more likely to be contaminated with residues from PFAS pesticides. Farmers are largely uninformed about the pesticides they are using on food crops, as no standardised labelling is required for PFAS pesticides. This leads to widespread usage of “forever pesticides”; for instance, just in 2022 alone, 9,200 kg of lambda-cyhalothrin was applied to 1.69 million hectares of UK land.⁸

Dietary exposure to PFAS pesticide residues poses proven health risks, including elevated cancer incidence and disruption to fertility and immunity. Of particular concern, childhood exposure is associated with developmental harms such as low birth weight and early onset of puberty, with profound long-term consequences. These impacts remain critically under-researched, underscoring the urgent need for stronger regulatory action and precautionary measures.

4.0 PFAS harm living organisms

PFAS are found in living organisms, including humans and wildlife. Even the most remote areas of the planet have not escaped its persistence, with polar bears in the Arctic Circle and penguin eggs in Antarctica⁹ found to be exposed to PFAS, with studies showing several PFAS levels in mother polar bears and their cubs in 1998 and 2008 exceeding the levels associated with health risks in humans.¹⁰ This is alarming, as PFAS are protein-binding, blood-accumulating contaminants that may have detrimental toxicological effects on the early phases of mammalian development, which includes humans.

PFAS is found in bodily fluid samples of humans with detectable levels in biomonitoring studies owing to its widespread exposure. In a study done by the Centre of Diseases Control and Prevention (CDC), United States, in the period of 1999-2000, the geometric mean blood PFOS level was 30 micrograms per litre, whereas PFOA was at approximately 5 micrograms

⁷ Wildlife and Countryside Link, 2023. Toxic chemical cocktails found at over 1,600 river and groundwater sites across England. <https://www.wcl.org.uk/toxic-chemical-cocktails-in-rivers-across-england.asp>

⁸ PAN UK, “‘Forever chemicals’ found in UK food – Pesticide Action Network UK.” <https://www.pan-uk.org/pfas-forever-chemicals>

⁹ Environmental Working Group. Global danger: Wildlife at risk from PFAS exposure https://www.ewg.org/interactive-maps/pfas_in_wildlife/map/

¹⁰ Bytingsvik J, van Leeuwen SP, Hamers T, Swart K, Aars J, Lie E, Nilsen EM, Wiig O, Derocher AE, Jenssen BM. Perfluoroalkyl substances in polar bear mother-cub pairs: a comparative study based on plasma levels from 1998 and 2008. *Environ Int.* 2012 Nov 15;49:92-9. doi: 10.1016/j.envint.2012.08.004. Epub 2012 Sep 23. PMID: 23010253.

per litre. Since the decline in production and use of PFOS and PFOA in the United States, blood PFOS and PFOA levels have declined by 85% and 70%, respectively.¹¹

Negative health implications associated with prolonged PFAS exposure have been widely studied across the globe. One such large-scale meta-analysis was conducted in a PFAS-contaminated water area in Italy (*Red Area*) by processing data from the Italian National Institute of Statistics' death certificate archives, in which PFAS exposure was directly associated with mortality from cardiovascular disease. The study also proved the correlation of kidney and testicular cancer with exposure to the chemical.¹²

Moreover, based on a systematic review of 42 research papers, there is a strong correlation between PFAS exposure (PFOA, PFOS, PFHxS) in infants and children with immunosuppression, particularly diminished childhood antibody response to vaccination.¹³ Evidence of harm to living organisms, especially humans, should prompt Malaysian regulatory bodies to address PFAS permeability and its long-term health impacts.

5.0 IPEN's stance on PFAS Pesticides

The International Pollutants Elimination Network (IPEN), of which CAP is a participating organisation, takes a strong position on the elimination of PFAS (“forever chemicals”) because of their extreme persistence, mobility and potential to cause long-term contamination of people and the environment.

In relation to PFAS pesticides, IPEN has particularly highlighted sulfluramid, a pesticide used mainly for controlling leaf-cutting ants and other pests, particularly in Latin America. Sulfluramid is of concern because its active ingredient can degrade into PFOS, a persistent PFAS and a chemical listed under the Stockholm Convention. IPEN has advocated for stronger restrictions and the eventual elimination of sulfluramid,¹⁴ including ending the remaining acceptable-purpose exemption for its use by the Stockholm Convention in 2009.

6.0 Malaysia's status on PFAS Pesticides

Malaysia does not currently have a specific regulatory framework that addresses PFAS as a class in pesticides. The current pesticide registration guidelines require pesticides to undergo evaluation before import, manufacture, sale and use, but they do not establish a specific prohibition on PFAS pesticides as a group.

As of September 2026, a total of 14 active ingredients used in pesticides in Malaysia are identified as PFAS, based on Fidra's PFASfree website <https://pfasfree.org.uk/>.

¹¹ ATSDR, 2024. Fast Facts: PFAS in the U.S. Population <https://www.atsdr.cdc.gov/pfas/data-research/facts-stats/>

¹² Biggeri, A., Stoppa, G., Facciolo, L. et al. All-cause, cardiovascular disease and cancer mortality in the population of a large Italian area contaminated by perfluoroalkyl and polyfluoroalkyl substances (1980–2018). *Environ Health* 23, 42 (2024). <https://doi.org/10.1186/s12940-024-01074-2>

¹³ von Holst H, Nayak P, Dembek Z. Perfluoroalkyl substances exposure and immunity, allergic response, infection, and asthma in children: review of epidemiologic studies. *Heliyon*, 2021; 7 <https://pmc.ncbi.nlm.nih.gov/articles/PMC8529509/>

¹⁴ IPEN, 2019. Sulfluramid: Central America Report. <https://ipen.org/publication/sulfluramid-central-america-report-2/>

The active ingredients are as follows: cyflumetofen, fluazifop-P-butyl, fluazinam, fludioxonil, fluopicolide, fluopyram, flutolanil, lambda-cyhalothrin, mefentrifluconazole, oxathiapiprolin, penoxsulam, pydiflumetofen, tetraconazole and trifloxystrobin. This amounts to 62 individual trade names in the Pesticides Board's list of registered pesticides, as listed in Table 1. It is to be noted that there is no information available explicitly stating PFAS pesticides in the portal of the Department of Agriculture of Malaysia.

Active Ingredient	Trade Name / Nama Dagangan
Cyflumetofen	DANISARABA 19 SC
Fluazifop-P-butyl	FLEXOR 13.2EC
	FUSILADE FORTE
	FUSILADE FORTE 150
	SIDAS 24 EW
	STALLION 13.2EC
Fluazinam	NUFARM FLUAZINAM 97 TC
Fludioxonil	NUFARM FLUDIOXONIL 98 TC
Fluopicolide	DURATA 400
	RAINITO 625
Fluopyram	VELUM P
	LUNA EXPERIENCE
Fluopyram + Trifloxystrobin	LUNA CLASS
Flutolanil	MONCUT 15% EC
	GRASTEN 45% WP
Lambda-cyhalothrin	SMILA 35WG
	ALANDA 2.8EC
	ALOTHRIN 2.8EC
	D-CYHALOTHRIN
	KARATE
	KARATE ZEON
	LARGIN 23 CS
	LATONIX 2.8EC
	ACABDA
	B-DA 23 SC
	B-DA 500
	BM LAMDA 2.8EC
	CMC LAMBDA 280
	HALO
	HI LAMBDA
	LAMBADA
	LAMBDO 100
	LUDIVA
	MAKO
	PILARMD
	SANTANA 2.8EC
	SILOCO 280
	TREKKER 28
	ZA LAMBDA
	ICON 10CS
	ICON 2.8EC
	ICON CS

	HEXTAR LAMBDA - CYHALOTHRIN TECH 95
	IMAS LAMBDA-CYHALOTHRIN TECHNICAL
	KEN-LAMBDA 95 TC
	K-LAMBDA TECHNICAL
	ASOMIN
	PLATO 75EC
	ALIKA ZC
	BUGWAY
	FC-SPINTER
	G-LOXAM
	COLAM ZC
	HOTSPUR ZC
	VERDICT
Mefentrifluconazole	BELANTY 34.9 SC
Oxathiapiprolin	DUPONT ZORVEC ENCANTIA
Penoxsulam	HALORICE 60
	RAINSULAM 21.7 SC
Pydiflumetofen	MIRAVIS D 18.38SC
Tetraconazole	DOMARK 40
	FUNGO 40 SC

Table 1. PFAS Pesticides: Active Ingredient & Trade Name
Information extracted from <http://www.portal.doa.gov.my/racunberdaftar/>

7.0 RECOMMENDATIONS

CAP urges the following measures to be taken:

(i) Restrict PFAS Use in Pesticides

Malaysia should urgently identify and restrict PFAS in pesticides to prevent highly persistent and toxic chemicals from entering agricultural systems. Stronger regulatory controls are needed to minimise long-term environmental contamination and consumer exposure.

(ii) Strengthen Research and Monitoring

Comprehensive studies should be undertaken to assess PFAS pesticide use, environmental persistence, occurrence in agricultural areas and food, and impacts on human health and ecosystems. Continuous monitoring would provide the evidence base for stronger, science-driven regulations.

(iii) Mandate Transparency and Labelling

Clear labelling of pesticide ingredients must be enforced, including disclosure of inert ingredients across the supply chain. Consumers and pesticide users have the right to know whether PFAS are present in pesticides used in food production.

(iv) Transition to agroecology

The Malaysian government should invest in programmes that empower farmers to adopt agroecological practices for safer, more sustainable pest management.

8.0 CONCLUSION

PFAS pesticides pose a serious and long-lasting threat to Malaysia's environment, food systems, and public health. Their persistence, toxicity, and potential to disrupt fertility, immunity, and increase cancer risk demand urgent regulatory action. By restricting PFAS use, strengthening research and monitoring, mandating full transparency in labelling, and transitioning to agroecological approaches, Malaysia can safeguard its agricultural systems, protect consumers, and uphold the fundamental right to safe and healthy food and environment.