Report

Double standard Double risk

Banned pesticides in Europe's food supply

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Pesticide Action Network Europe

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Hazardous pesticides banned in Europe are currently produced by European companies and exported to third countries, where safety regulations are generally weaker. The use of these toxic pesticides has devastating impacts on both human health and the environment, leading to widespread human rights violations.

This report highlights the alarming fact that these dangerous pesticides find their way back to Europe as residues in food. They are found in randomly collected samples from Member States' national monitoring programmes not expected to be of any risk. Alarmingly, the report also demonstrates that some of these pesticides continue to be used within Europe despite their ban.

Pesticides such as the mutagenic carbendazim or toxic to reproduction linuron and propiconazole, or bee-killing neurotoxic insecticides like thiamethoxam, clothianidin and imidacloprid, continue to be detected in plant-based food sold across Europe. These are often found in 'pesticide cocktail' mixtures. In some cases, they even exceed the established legal residue limits for individual pesticides. We also show that Maximum Residue Limits for banned pesticides are not automatically lowered to the legally defined minimum (limit of determination 0.01 mg/kg or lower). Instead, higher allowed residue limits are regularly kept in place to please international trade partners, putting European citizens' health at risk.

The export of banned and hazardous pesticides endangers the health of people and the environment in third countries. It also places EU farmers at a competitive disadvantage. Consumers unknowingly face exposure to dangerous chemicals that should have no place in their diets. This report seeks to shed light on the EU's unethical double standards regarding banned and hazardous pesticides and calls on policymakers to take decisive action to end this practice.

Overview

PAN Europe analysed the data collected by the European Food Safety Authority (EFSA) on pesticide residues in food, from the official control programmes of EU Member States. We focused on randomly collected, plant-based 'low-risk' samples and screened them for residues of pesticides banned or severely restricted in the EU. These are listed in the Prior Informed Consent (PIC) Regulation, which governs the trade of certain hazardous chemicals that are banned or severely restricted in the EU (referred to as 'PIC pesticides'). In 2022, out of the 197 pesticides on the PIC list, **69 banned and hazardous pesticides were detected in European food**.

Product categories of concern:

Zooming into the product categories we find that certain products contain EU banned pesticides more often than others: **tea (38.3%), coffee (22.7%), spices (12.5%) and legumes (11.4%). Overall, imported food is twice as likely to contain EU-banned pesticides compared to food grown within the EU.** This might not be surprising, but spices, legumes and cereals grown outside the EU **were 4 to 16 times** more likely to be contaminated with banned pesticides than those grown within the EU.

What about fruit and vegetables?

European-grown fruit with the highest contamination rates included currants (13.2%), bananas (13.2%), grapefruit (8.8%), and blueberries (8.8%). For imported food, grapefruit (30.2%), mandarins (26.3%), limes (23.9%) and oranges (13.4%) showed higher contamination rates. Worryingly, 7% of EU-grown banana samples exceeded legal MRLs. Imported exotic fruits like dragon fruit and passion fruit also exceeded legal limits (5.9%), with many samples contain-

Summary

ing multiple residues. Vegetables showed lower contamination rates with PIC-banned pesticides. Very popular products like potatoes, cucumbers, lettuces and tomatoes grown in the EU showed a contamination between 4.3% (tomatoes) and 6.6% (potatoes). Imported products like peas, beans and cucumbers showed higher contamination rates ranging between 12.5% (cucumbers) and 20% (peas).

Where does the contaminated food come from? Looking at the exporting countries with highest rates of samples with EU banned pesticides, on the top five we have India (23.6%), Uganda (17.7%), China (16.8 %), Kenya (16.5%) and Brazil (16%). Concerning EU-grown food, highest rates of banned pesticides were found in food samples from Portugal (12.7%), Malta (8.8%), Poland (7.7%), Cyprus (6.5%) and Austria (5.5%).

The situation is not improving. Between 2011 and 2022, the rate of samples with EU-banned pesticides went up 10 times (10x) for coffee and three times (3x) for spices.

Top offenders? The most frequently detected included the mutagenic and toxic to reproduction fungicide **carbendazim**, the toxic to reproduction pesticides linuron (herbicide) and propiconazole (fungicide), and the suspected carcinogen **chlorpropham** (herbicide). Several samples had residues of the bee-killing neurotoxic neonicotinoid insecticides clothianidin, thiamethoxam and imidacloprid. Among the 69 PIC pesticides we detected, 53 even exceeded the legal limits (MRLs) in at least one sample.

Effects of France's export ban. In 2018, France adopted a law to stop the export of EU-banned pesticides, but the Regulation entered into force only in 2022. However, the findings show that in 2022, 2.5% of 'low-risk' food samples in France still contained banned pesticides. Spices (11.8%) and legumes (11.1%) were on the top of the list. Specific samples with highest rates of EU-banned pesticides were Tahiti limes (16.4%), passionfruit (10%), rice (14%) and courgettes (8%). The countries exporting the highest percentage of samples with banned pesticides to France were Vietnam (24%), Brazil (17%), Chile (10%), Egypt (10%), Colombia (9%) as well as Morocco (6%). Alarmingly, apart from mutagenic carbendazim, highly toxic and persistent organochlorine pesticides aldrin and dieldrin were detected in food produced in French territories (courgettes, cucumbers, butternut squash).

Loopholes and breaching the law: Contrary to public belief, banned pesticides are still permitted in EU food production, either through loopholes or trade agreements. Our study found that currently the **EU permits residues of at least 60 EU banned pesticides** in certain food products, mostly to please international trade partners. Moreover, we found that ahead of the sampling, five of these pesticides had been authorised to be used in specific EU countries under 'emergency situation', a derogation that must not be used for hazardous EU-banned pesticides according to the European Court or Justice.

Considering the pesticides that were detected in at least 30 samples (of EU or non-EU origin), we have a list of 16 pesticides. Only for 7 out of these 16 pesticides, the MRLs have been lowered to the legal minimum (the limit of determination). For the rest, the EU gives its consent to import food that contains residues of dangerous toxic pesticides.

Urgent call for policy measures: The EU has committed to stop the production and export of pesticides banned within Europe due to their high toxicity, but these measures have yet to be presented and implemented. Member States continue to receive unlawful derogations to use banned pesticides in their crop in pure oversight of the EU law and case law. In the meantime, the European Commission and Member States permit residues of such dangerous pesticides in imported food. Members of the European Parliament have repeatedly objected to this and call for zero tolerance of such residues in EU food.

In the face of a global crisis driven by chemical pollution and biodiversity loss, we urge EU policymakers to demonstrate leadership by ending these unethical double standards. Pesticides deemed too toxic for use here are too toxic for use everywhere. Protecting public health and biodiversity, both within and beyond Europe, must take precedence over trade and industry profits.

Glossary

CXL	Maximum Residue Level set by the FAO Codex Alimentarius Commission
ECHA	European Chemicals Agency
EDC	Endocrine Disrupting Chemicals
EFSA	European Food Safety Authority
FAO	Food and Agriculture Organization
GHS	Global Harmonized System
LMICs	Low- and Middle-income Countries
LOD	Limit of Determination
MACP	Multiannual Control Programme
MANCP	Multiannual National Control Programme
MRLs	Maximum Residue Levels - is the highest level of a pesticide residue that is legally tolerated in or on food or feed
MS	Member States
PIC	Prior Inform Consent
POP	Persistent Organic Pollutants
US EPA	United States Environmental Protection Agency
WHO	World Health Organization

Introduction

Pesticides deemed too hazardous to be used in Europe, continue to be produced by European factories after their ban and are exported to be used in third countries with weaker protection laws. The European Union is simply giving its consent, turning a blind eye to the devastating impacts that these chemicals have on the health of the farmers, their families and local communities as well as the surrounding environment and its natural resources. Meanwhile, the EU is importing food products grown with these pesticides and in many cases it allows residues of such pesticides to be present in EU foods. This not only puts European farmers at an unfair disadvantage but also means that European consumers end up with these residues of toxic substances on their plates.

The European Union has acknowledged this unethical double standard and has promised under the Chemicals Strategy for Sustainability to deliver measures to "ensure that hazardous chemicals banned in the European Union are not produced for export". However, these measures, originally scheduled for 2023, are still pending. Some countries have taken the initiative, with France and Belgium partially stopping the export of pesticides banned for use in their countries.

In 2018, France adopted a law to stop the export of EU-banned pesticides, but it is worth underlining that the French legislative scheme contains major loopholes. The ban applies to plant protection products "containing" substances that are not authorised in Europe, but not to the active substances themselves. In addition, the decree implementing the law introduces a derogation: pesticides may continue to be exported a) when authorisation has expired but the product has not been formally banned at European level, and b) when manufacturers have not submitted applications for renewal. Belgium, on the other hand, adopted in 2023 a legislation that prohibits the export of active substances and products that contain them, but so far only 25 substances have been included in the scope of the ban.

Recently, the report of the Strategic Dialogue on the Future of EU Agriculture - a consensus report by diverse EU stakeholders mandated by the European Commission - highlighted in its recommendations the need for the EU to show leadership "by ending the practice of unethical double standards". In this respect, it calls Member States "to stop exports of EU banned hazardous pesticides to countries with less stringent regulations". Meanwhile, Members of the European Parliament are regularly objecting to EU's attempts to please the trade partners by permitting residues of certain such pesticides in imported food, they highlight "if we ban products in Europe they should be banned in all the products consumed in Europe."

Another way European consumers may be exposed to EU-banned pesticides in their food is when Member States claim an 'emergency situation' and request authorisation to use these pesticides in the production of specific EU crops. This results in residues on the current crop but also in nearby fields and surrounding environment. As recently demonstrated by PAN Europe[1], when a pesticide is banned in Europe due to health or environmental concerns, Member States often trigger a derogation under the EU Pesticides Regulation to continue its use, arguing that the 'danger cannot be managed by other means.' However, as clarified by the EU Court of Justice in the PAN Europe ruling[2], this derogation should not apply to pesticides banned for being too toxic to humans and the environment. Despite this, Member States continue to issue authorisations for such banned pesticides

The present report by PAN Europe demonstrates that this EU double standard results in residues of hazardous and banned pesticides in products sold in food markets across Europe. It builds on previous work[3, 4], carried out by a coalition of civil society organisations from Europe and the global South, and aims to encourage EU policy makers to deliver their promise, put an end to the export of EU-banned and hazardous pesticides to third countries and permit no such residues in imported food.

Background

The use of pesticides in Europe is governed by the Regulation (EC) 1107/2009 (hereafter EU Pesticides Regulation), which aims "to ensure a high level of protection of both human and animal health and the environment and at the same time to safeguard the competitiveness of Community agriculture" (recital 8). Its provisions are underpinned by the precautionary principle in order to prevent active substances or products placed on the market from harming human or animal health or the environment. Thus, pesticide active substances are approved for a maximum period of 15 years (depending on the type of substance and whether it is a new substance or a reapproval) under the condition that they meet all the safety criteria set by the law.

As part of the assessment procedure, before a substance can be approved, it must be demonstrated that its use is safe for people's health, including from residues in food, for animal health and that it has no unacceptable effects on the environment. Pesticides that cause harm to humans and the environment must be banned. For particularly dangerous substances the EU Pesticide Regulation established in 2009 'hazard-based cut-

1 PAN Europe report, 2023. Banned Pesticides still in use in the EU.

2 Judgement of the Court, PAN Europe Case C-162/21

3 Joint Statement: NGOs AND Trade Unions demand the end of EU's export of banned pesticides and other hazardous chemicals

4 Letter of NGOs to new Members of the European Parliament about stopping EU-banned pesticides export

off criteria' so that substances classified as mutagens, carcinogens, toxic to reproduction and endocrine disruptors or as Persistent Organic Pollutants (POPs) and Persistent Bioaccumulative Toxic (PBT), are swiftly banned. For such pesticides there is no safe level of exposure.

The EU's ambition for a high level of protection includes the monitoring and control of the residues of pesticides in our food. The Regulation (EC) No 396/2005 establishes the maximum levels of residues of pesticides in or on food that are considered acceptable in the EU (Maximum Residue Levels or MRLs). Logically, if a pesticide active substance is banned or its use is severely restricted for health reasons, it should not be found as residues in the food that we eat. Therefore, the MRLs should be deleted (i.e. should be set to the default value of 0.01 mg/kg)[5]. However, this is not happening automatically and in some cases, it is not happening at all. Some residues of banned or restricted pesticides are allowed to be detected in food to facilitate international trade[6] resulting in the presence of dangerous residues in our food.

In addition, in most cases these pesticides are not used alone but together with other pesticides, resulting in 'cocktails' of such residues in our food. The 'safety' limits (MRLs) for pesticide residues in food are still established on the assumption that consumers are exposed to a single such chemical. Not enough has been done yet to address the risk represented by the use of multiple pesticides in food production resulting in mixtures of residues in food, often on the same piece of fruit. Even if every single residue is within these legal limits and the exposure is considered to be "safe", the exposure to different residues together, may lead to additive or synergistic adverse effects that have not been evaluated by regulators. This remains to be taken into consideration in the risk assessment of pesticides and establishing the MRLs, despite the requirement of the EU law to take into account cumulative and synergic effects (Article 4(2) Reg. 1107/2009; Article 14(1); 36(1) Reg. 386/2005).

Moreover, pesticides that have been banned in the EU because they can cause harm to human health and the environment, often continue to be used in European crop fields because Member States claim an 'emergency situation' by abusing a derogation under EU Pesticides Regulation to receive an authorisation of use (Article 53). This results in European farmers, residents of agricultural zones

[5] When the authorisation for a pesticide is revoked, the MRLs set out for this substance is no longer valid but it is substituted by a 'default level' of 0.01 mg/kg

[6] According to Article 3 of Reg 396/2005:
(e) 'CXL' means an MRL set [at an international level to facilitate trade] by the Codex Alimentarius Commission;

(g) 'import tolerance' means an MRL set for imported products to meet the needs of international trade where:

- the use of the active substance in a plant protection product on a given product is not authorised in the Community for reasons other than public health reasons for the specific product and specific use; or
- a different level is appropriate because the existing Community MRL was set for reasons other than public health reasons for the specific product and specific use;

and their families, as well as EU consumers to continue to be exposed to dangerous pesticides.

Pesticides which are banned or severely restricted in the EU are listed under the Regulation (EU) 649/2012, also known as the Prior Informed Consent (PIC) Regulation, which concerns the export and import of such hazardous substances. Under this Regulation, while pesticides banned in the EU because of their toxicity cannot be used, their export to third countries is still allowed as long as the importing countries give their consent. In 2018 alone, more than 81,000 tonnes of pesticides containing 41 different hazardous chemicals banned on EU fields, were exported from European factories for use in agriculture in other countries.

The EU's exports of banned pesticide are mainly destined for low- or middle-income countries (LMICs), with weaker environmental and health protection laws. In these importing countries, the risk of human and environmental exposure is much higher than in the exporting countries, and this poses particular risks for vulnerable groups such as children and pregnant women. Additionally, farmers and farmworkers often lack access to any protection equipment against pesticides exposure. The presence of such pesticides in households also leads to tragic incidents of acute poisoning accidents and suicides every year. The UN Special rapporteur on Toxics and Human Rights emphasised that "the export of banned or restricted substances for use in importing countries that cannot or do not have adequate assurances that human rights will be respected, protected and fulfilled is exploitation and may violate the principle of non-discrimination".

Moreover, allowing the export of toxic substances to third countries, Europe is putting in place a boomerang system under which these hazardous chemicals come back as residues in our daily food. Indeed, imported food is more contaminated with residues of such pesticides compared to food grown in EU[7].

This situation is aggravated by the misuse of the above mentioned "import tolerance" system for international trade, in line with Regulation 396/2005, concerning setting Maximum Residue Levels (MRLs) of pesticides for imported food. The EU Commission can establish MRLs for active substances that are not authorised in the EU following an 'import tolerance' request from Member States, third countries or manufacturers. Such requests must not be given to pesticides that are not authorised in the EU because of public health reasons. But in clear disrespect of the EU law's provision for a "high level of protection", when pesticides found to be hazardous are banned in the EU, the Commission and Member states maintain the MRLs in imported food set to please trade partners, whether it was an import tolerance or international CXL. As explained in a recent report if a residue is "legal" it does not mean that it is safe.

[7] Banned and Hazardous Pesticides in European Food – Report PAN Europe 2020

Aim of the report

Aiming to raise public and political awareness, the present report focuses on the presence of residues of EU-banned pesticide active substances - that are listed under the PIC regulation - in food sold across the EU market. It highlights how the current legislation is less vigilant than it claims to be.

Its specific aim is to demonstrate how residues of toxic pesticides find their way on our tables, resulting in unnecessary exposure to highly hazardous chemicals for both EU consumers and non-EU producers, and the environment.

Using the official national monitoring data of pesticide residues in food, we first examine whether residues of banned pesticides are detected in food sold in the EU market, and then explore which residues of EU banned pesticides are allowed or not in EU imported food.

This study underlines the urgent need for action to improve the protection of EU and non-EU citizens by ensuring that EU-banned pesticides are not used in Europe, deleting the MRLs for banned and severely restricted pesticides, ending the practice of allowing import tolerances for banned pesticides and ultimately stopping the EU production and export of pesticides deemed too toxic for use in Europe.

Methodology

All pesticides considered too hazardous for human health and ecosystems that are banned or severely restricted in the EU, are listed under the Regulation (EU) 649/2012, which regulates their export. In this report we will focus only on these active substances, referred to for simplicity as **"PIC pesticides"**.

Under the European Union legislation (Article 32, Regulation (EC) No 396/2005), the European Food Safety Authority (EFSA) has to provide an annual report assessing the pesticide residue levels in foods sold in the European market.

The analysis builds on the EU official monitoring programmes, which mandate national competent authorities in EU Member States to annually control the presence of pesticide residues and any exceedances of Maximum Residue Limits (MRLs) in sampled food products. These national data are collected and made public by the EFSA, which aggregates the data and publishes annual reports on pesticide residues in EU food.

PAN Europe extracted the "objectively" (randomly) sampled products data from the EU Multiannual Control Programme (or EU MACP) and from the Multiannual National Control Programme (or MANCP). To ensure a completely objective approach, all 'targeted samples', collected and monitored using a risk-based approach because they are suspected to be of 'high risk' (to contain pesticides above the legal levels), were excluded from the study. Therefore we only analysed the **randomly selected samples** that were considered by Member States of 'low risk'. Organic samples were not excluded.

We decided to consider plant-based food samples only; food of animal origin was outside the scope of the analysis.

Therefore, for 2022, out of 110,829 samples collected in EU Member States, our study took into consideration 48,167 samples.

These monitoring programmes are not designed to provide statistically representative results for residues expected in food placed on the European market.

PAN Europe **extracted the pesticides** which were listed under the PIC in 2022 from the European Chemical Agency website (197 pesticides)[8] to investigate whether hazardous and EU banned pesticides are detected in food sold in the European market.

For the year 2022, which provides the most recent available monitoring data, PAN Europe investigated the following:

- which products were most contaminated with PIC pesticides,
- which countries presented the highest frequency of samples with PIC pesticides and
- which PIC pesticides were the most often detected.

This analysis has been carried out for all 27 EU Member States combined, and individually for France, as a case study.

[8] The last amendment we took into consideration that added pesticides in the Annex I list of Regulation (EU) No 649/2012 was from May 2020

Methodology

To highlight the trend over the last decade, we extracted from the EU official monitoring database of pesticide residues in food for the period 2011-2022, which included samples collected in EU Member States in this period.

The samples analysed were split into the following main categories:

- Cereals
- Coffee
- Fruits
- Herbs
- Legumes
- Nuts
- Spices
- Tea
- Vegetables

We considered the percentage of contaminated samples in crops grown in the EU and outside the EU, the percentage of samples exceeding the MRLs and the percentage of samples with more than one PIC residue per food item. We also outlined which pesticides were detected and their frequency of detection in the samples.

For the EU-wide results, only products and countries which have been sampled at least 50 times are presented in the results. For the per country results, the minimum number of samples is 10. This way, only the more significant results are presented.

Only residues of PIC pesticides that were found with a concentration level above or equal to 0.01 mg/kg have been included, which is considered the default detection limit (or limit of determination LOD) for pesticide residues in Regulation (EC) No 396/2005. Through the years, due to advances in technologies, it is possible to detect pesticides at smaller concentrations and the actual analytical detection limit of several pesticides is now much lower than 0.01 mg/kg. As a result, during the years, more residues might be detected and therefore unjustly an increasing trend might be observed, since such residues below 0.01 mg/kg might not have been found in earlier years. Therefore, to distinguish genuine trends, only residues above 0.01 mg/kg were included in the analysis.

Furthermore, as of 2019, Member States must report their monitoring data using the new Standard Sample Description (SSD version 2, SSD2). This entails a more detailed classification of products (e.g. black currants, red currants instead of 'currants'). To include the data from 2019 and further in the trend analysis, the different kinds of products are grouped together again under the same ‘product family’ (e.g. currants).

Study limitations

It is important to point out that, according to EFSA, “the reporting countries define the priorities for their national control programmes considering several factors such as the importance of food products in trade or in the national diets, products with historically high residue prevalence or non-compliance rates in previous years, the use pattern of pesticides and national laboratory capacities”. Further, EFSA explains that “the results of national control programmes cannot be used to compare countries directly as there are specific needs in each country and dietary habits, and access to local products may differ among them. The number of samples and/or the number of pesticides analysed by any reporting country is determined by the capacities of their national control laboratories and available budget resources”. This means that data collected across Member States is not homogenous and while it is not possible to make direct comparisons between countries, the information provided is a realistic snapshot of the general situation in Europe.

It is also not possible to make direct comparison between the same type of crops grown in the EU and imported because there are different types of crops sampled and analysed under the same category (eg. cereals, vegetables, fruits). For example, when we talk about fruit, different types of fruits have been analysed in each country. Hence, since all types of fruit are under the same category “fruit” we generally compare the whole category, instead of specific types of fruit.

This suggests that, even if attempts have already been put in place to improve the sample collection and analysis, further efforts should be made to definitely harmonise the data collection and analysis to ensure the same level of protection to all the EU citizens.

Results

PIC pesticides in our food: an overview

Exploring the data collected by the Member States and gathered by EFSA we found that overall among all the 48167 food samples assumed to be of 'low risk' that we took into consideration, 2147 (4.5%) were contaminated by PIC pesticides.

To examine whether this average value is higher for certain types of food, we divided the samples into different categories. The number of samples that fall under the nine main categories of food we analysed, are shown in Figure 1.

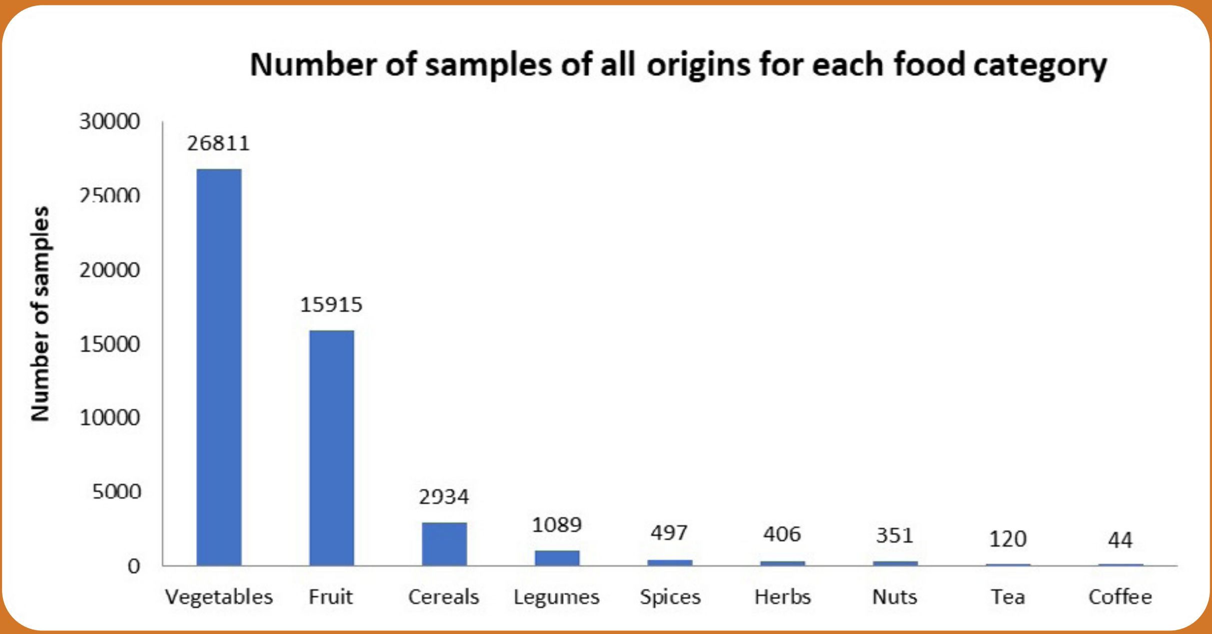

Figure 1. *Number of food samples analysed, divided into different food categories.*

Looking in detail at the food categories as we see in Figure 2 the results are alarming. The category that had most samples with PIC pesticide residues was tea (38.3%), with no less than 18.3 % carrying multiple such residues and 5% of samples exceeding the MRL. Coffee is not much better with the second-highest percentage of samples with PIC pesticides (22.7%), all the samples (22.7%) with multiple residues and 2.3% of samples exceeding legal limits. Thereafter, 12.5% of spices' samples had PIC pesticides, with 3.2% carrying multiple residues and 2.0% exceeding the MRL. Legumes follow with 11.4% of contaminated samples and a relatively high rate of MRL exceedances (3.9%). Fruits and vegetables show a lower percentage of contaminated samples, respectively 6.7% and 2.7% but their popularity makes even a low percentage noteworthy.

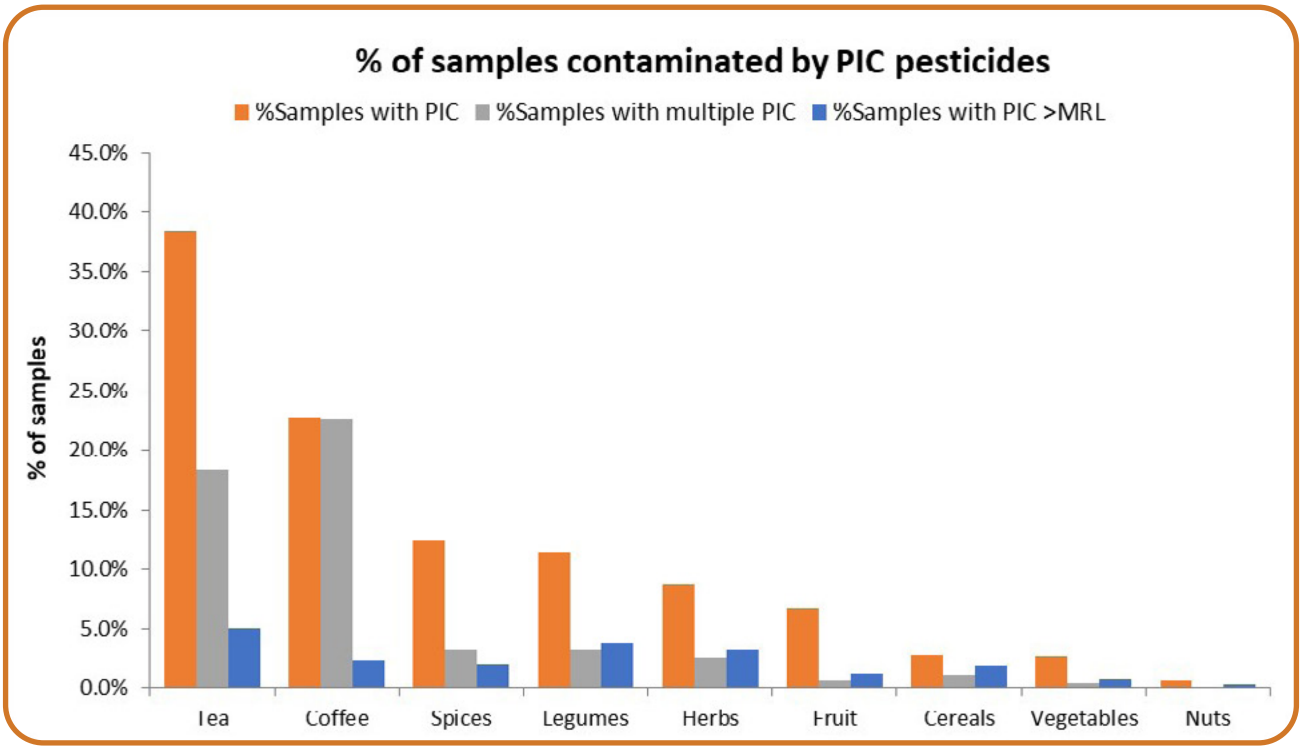

Figure 2. *Food produced within and outside the EU contaminated by PIC pesticides-expressed in %.*

All the coffee samples systematically contained two or three pesticide residues per sample, whereas almost half of the tea samples had multiple residues, in this case up to six pesticides. The category carrying the maximum number of residues on a single sample is fruit, with up to seven different pesticides in the same sample (Figure 3).

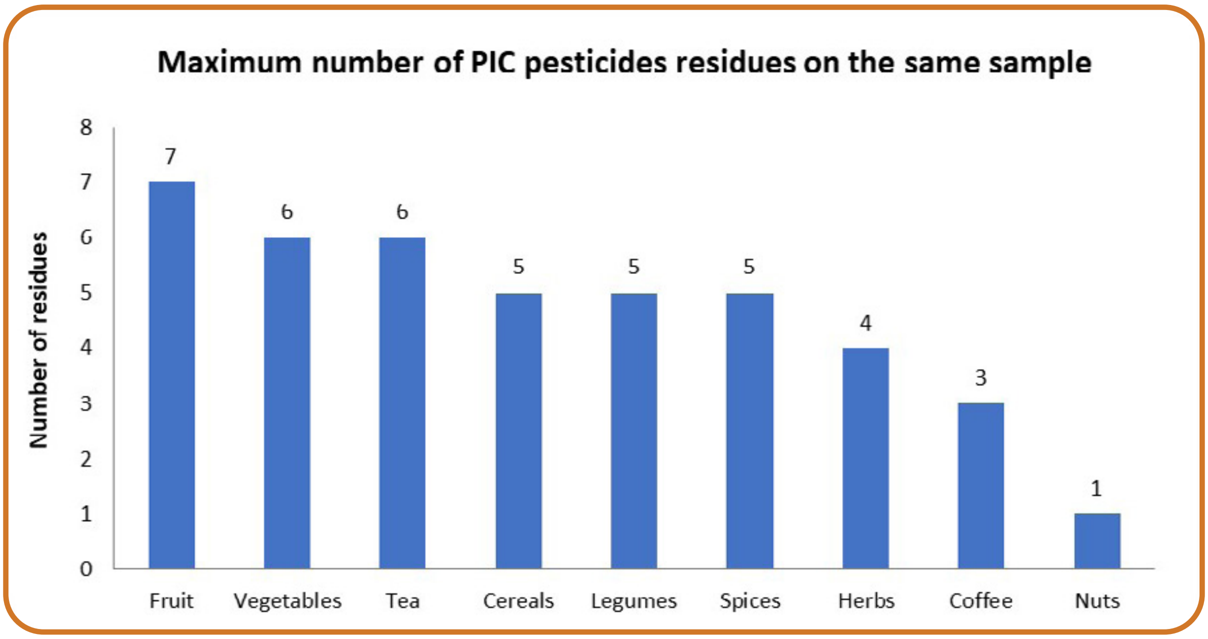

Figure 3. *Number of residues of different pesticides detected in the same sample.*

Uninvited guests at our table

We found nearly 70 'uninvited guests' present at the tables of European consumers through their daily food: a total of 69 different EU-banned pesticides were identified across all samples, representing 35% of all the hazardous pesticides ever banned and listed under the PIC Regulation. The food categories carrying the highest number of different PIC pesticides were vegetables followed by fruits (Figure 4).

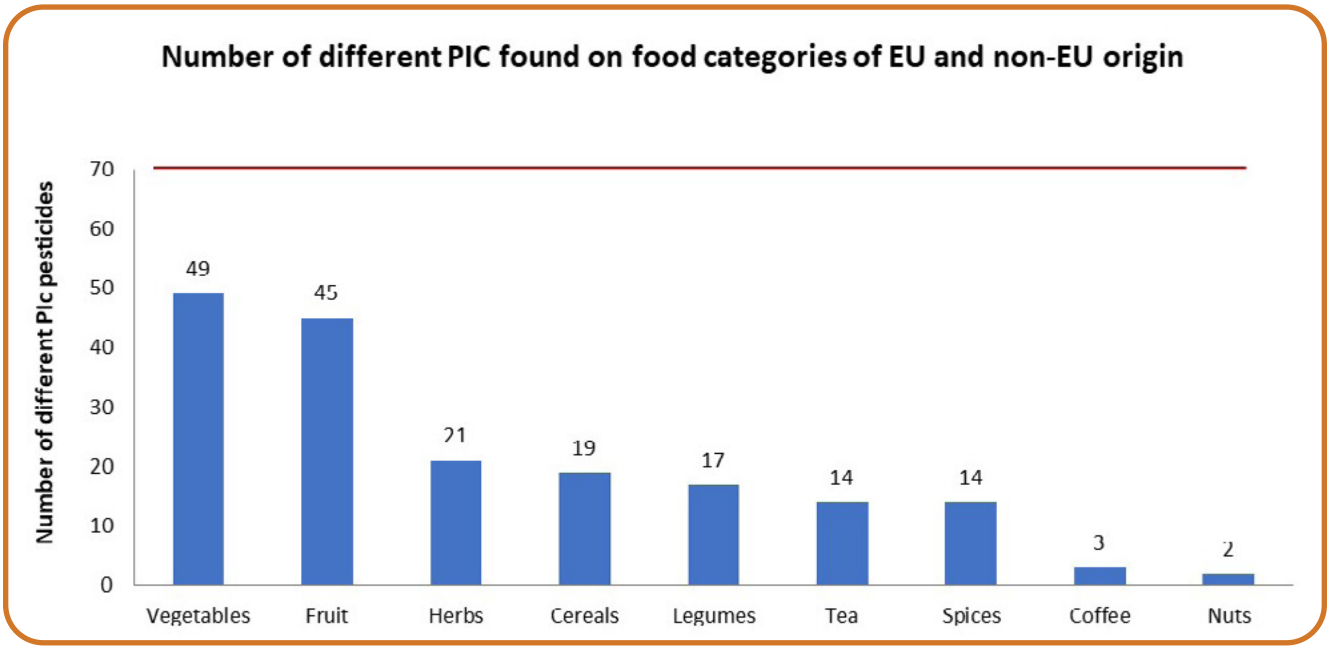

Figure 4. *Number of PIC pesticides found in different food category*

The analysis unveiled that imported food is twice as likely to be contaminated with PIC pesticides than EU food.

Comparing the percentage of contaminated samples of EU and non-EU origin, per category, we see that the rate of contamination was significantly higher in imported products (Figure 5). The number of contaminated tea samples (which includes herbal teas) was almost the same in EU and non-EU grown samples. Legumes grown outside the EU showed a percentage of contaminated samples which was more than eight times higher than EU samples, and for spices four times. Cereal samples from outside the EU were 16 times more often contaminated than EU cereals while the percentage of contaminated samples of vegetables was higher in EU crops. Imported fruits present a percentage of contamination which is more than three times the percentage of EU fruits.

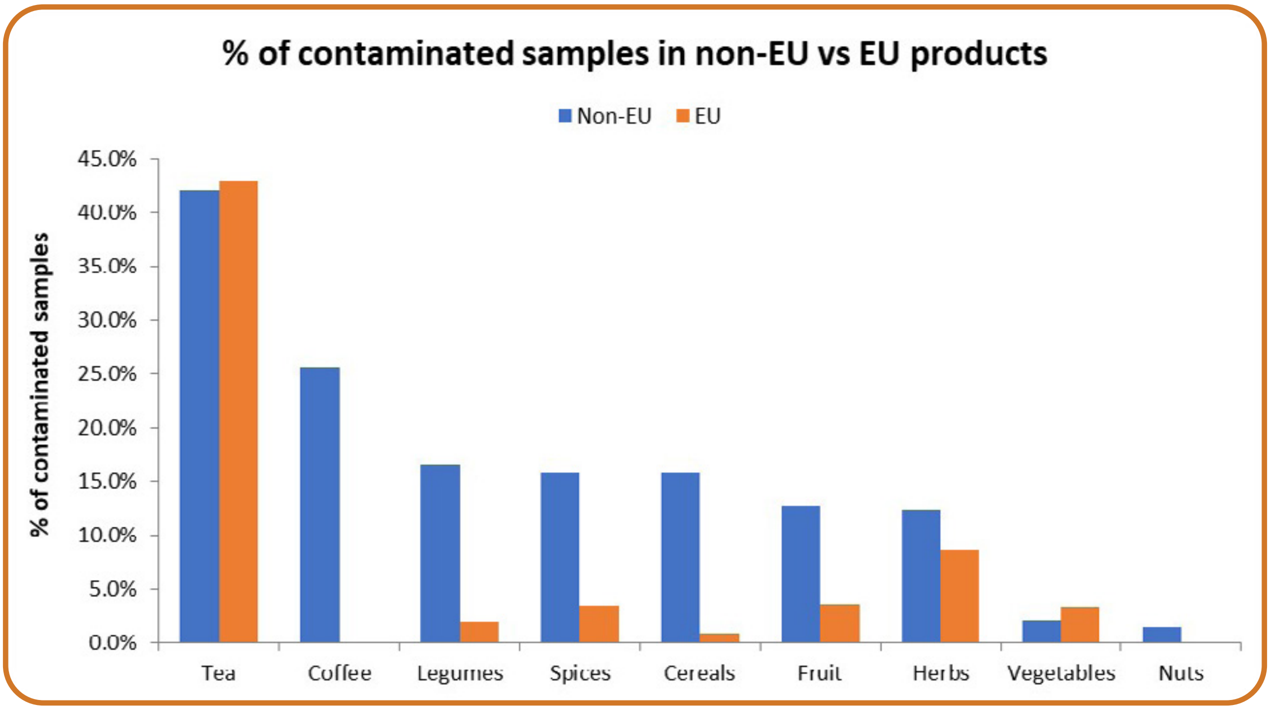

Figure 5. *Percentage of EU and non-EU samples with PIC pesticide residues*

The rate of multiresidue samples is also considerably higher in imported food compared to EU crops (Figure 6). Coffee had the highest percentage of samples with multiple PIC pesticides (25.6%), with one out of four samples having more than one PIC pesticides. After coffee, imported tea samples had the highest percentage of samples with multiple such residues (21%), followed by cereals (6.6%), herbs (5.3%) and legumes (4.7%). Among the EU samples, the ones with the highest percentage of samples with multiple PIC pesticide residues were tea (14.3%) and herbs (2.2%).

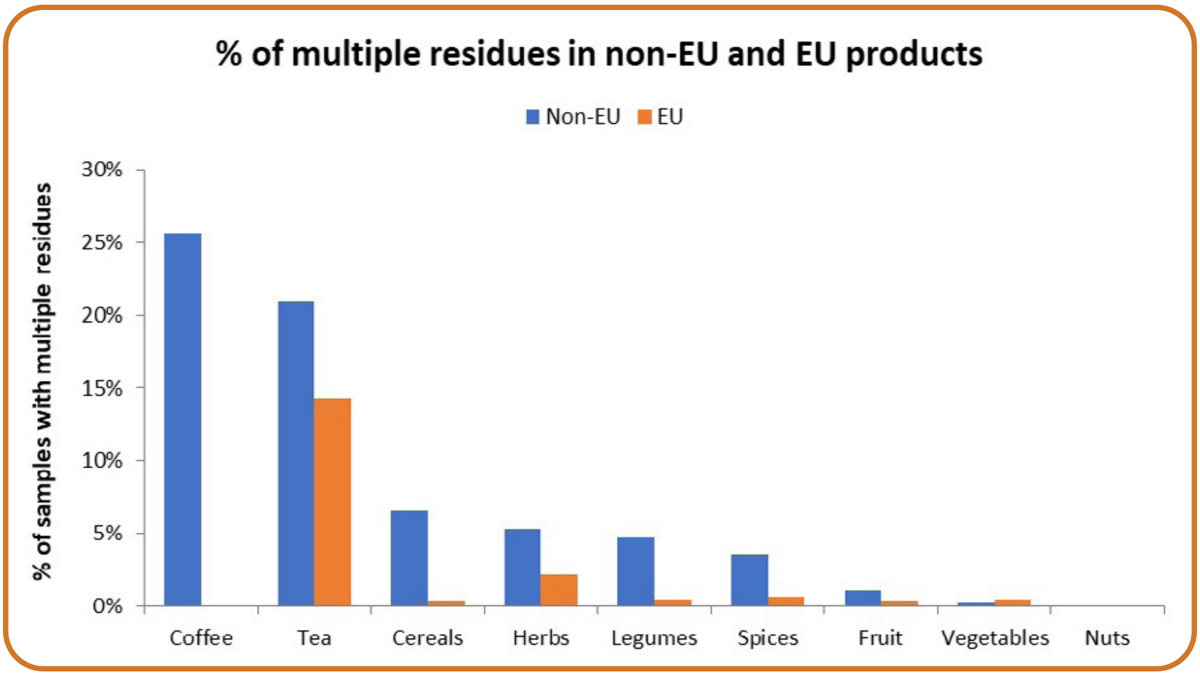

Figure 6. *Percentage of samples with multiple residues in EU and non-EU products*

It is worth highlighting that while the number of samples with PIC pesticides in vegetables, herbs and cereals is not much different between EU and non-EU food (Figure 7), ten more PIC pesticide substances were detected in imported fruits. In non-EU spices, tea and legumes the number of PIC pesticides found is respectively three times, seven times and eight times higher than in EU products.

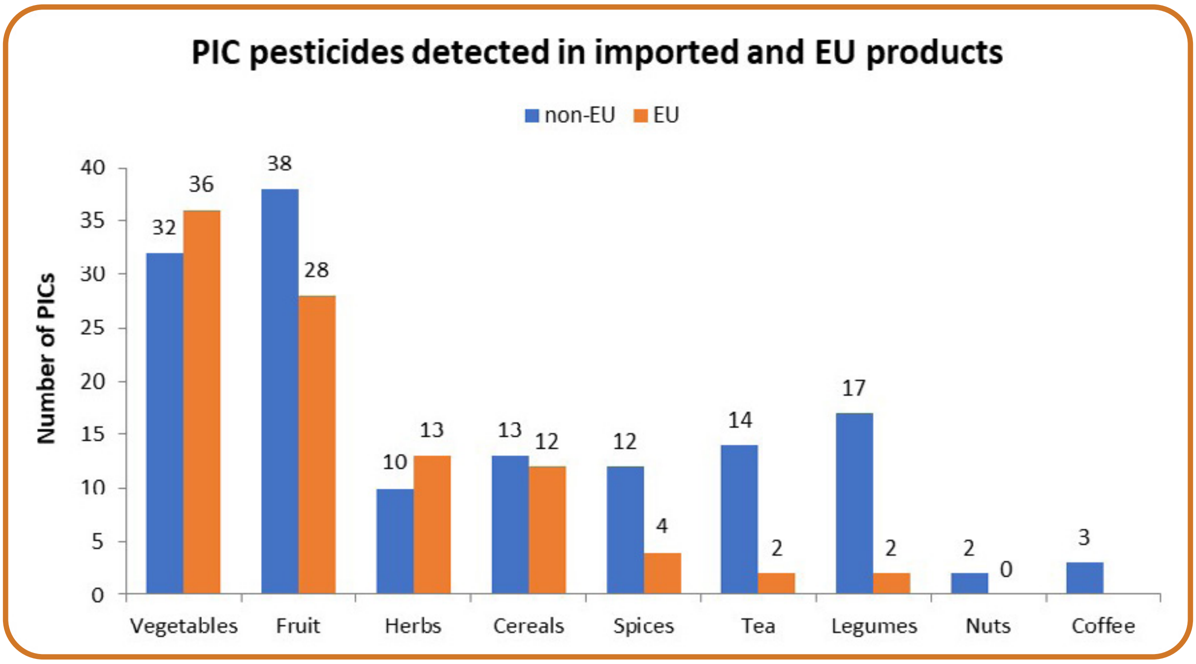

Figure 7. *Number of PIC pesticides residues detected in EU and non-EU food products*

Looking at the number of different pesticides found on a single sample, again the situation is worse for imported products. As shown in Figure 8 the number of PIC detected on a sample is two to three times higher in non-EU products except for herbs.

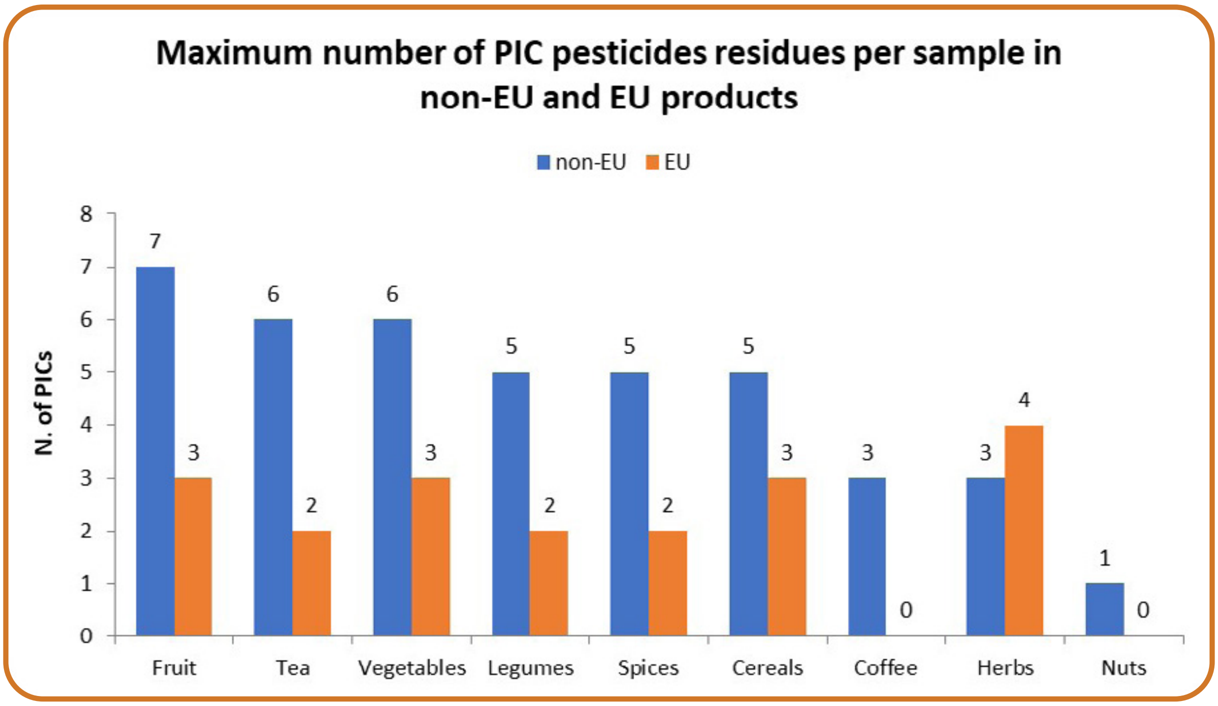

Figure 8. *Maximum number of PIC pesticides residues detected in a single sample in EU and non-EU products*

At a glance:

A total of 69 different EU-banned pesticides were detected in all samples

The imported food is twice as likely to be contaminated with PIC pesticides than EU food

Imported legumes are eight times more often contaminated than EU samples, spices four times, cereals sixteen times and fruits more than three times

The total number of PIC pesticides detected in fruits and vegetables is similar in EU and non-EU food, but there is a higher number of residues on a single sample in non-EU crops

Fruit salad with a zest of toxicity

For a more detailed overview we analysed the most often contaminated fruits and vegetables grown in the EU and outside the EU. In figure 9, it is shown that among the EU grown fruits, currants and bananas present the highest percentage of contaminated samples (both 13.2%). The percentage of contamination of grapefruits, blueberry, apricots and cherries ranges between 7.9% and 8.8% and all these fruits have samples with multiple residues. Popular fruits like pears, apples, peaches and plums have a lower percentage of contaminated samples but all have samples with multiple residues. The fruit with the highest percentage of samples exceeding the MRL are bananas (7%).

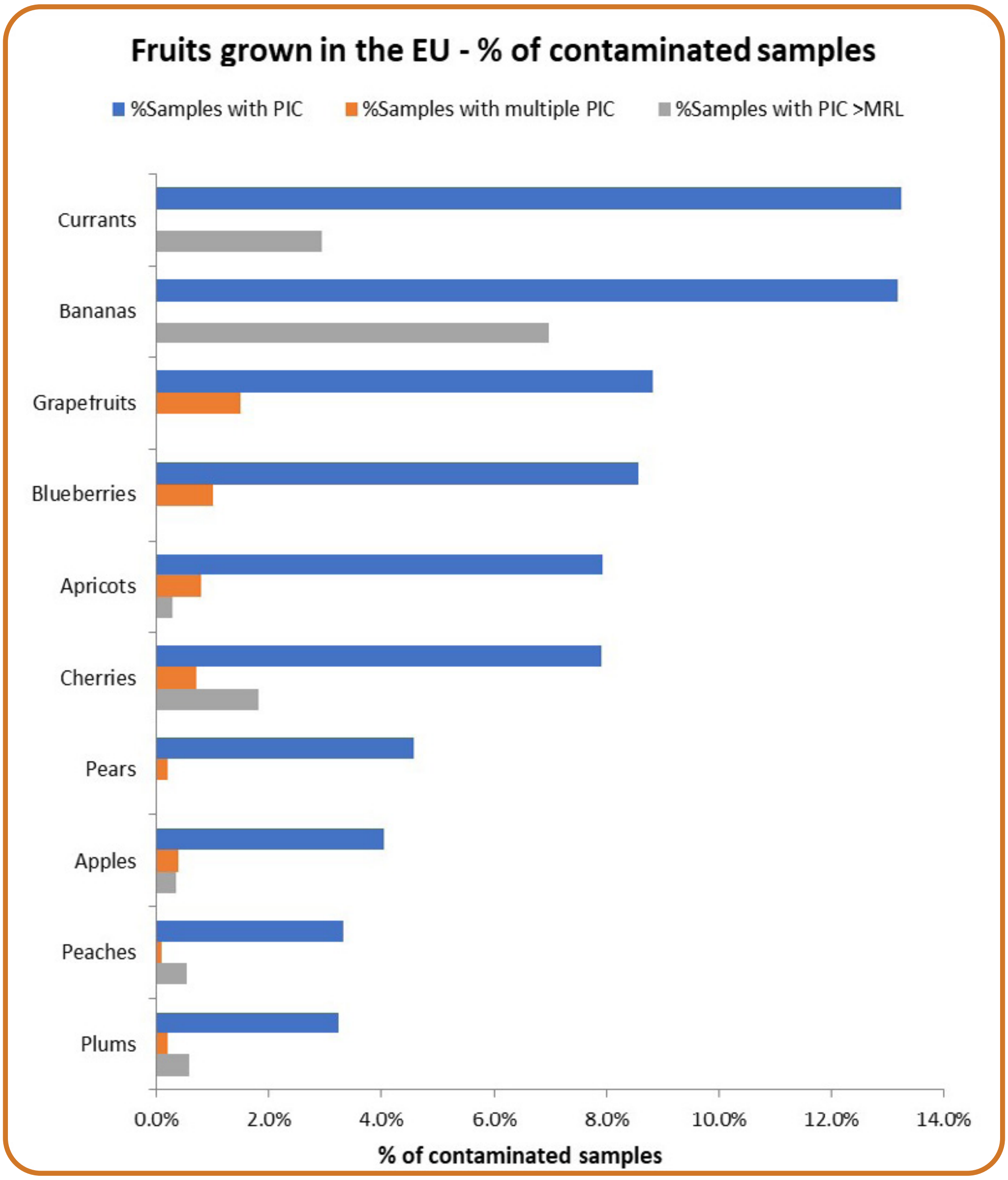

Figure 9. *Most contaminated fruits grown in the EU*

Imported fruits show a remarkably higher percentage of contaminated samples with PIC residues compared with fruits of EU origin (Figure 10). In general, citrus fruits had the most contaminated samples, ranging from 13.4% (oranges) to 30% (grapefruit). Very popular fruits like melons and pineapples have a percentage of contaminated samples around 10% but without multiple residues. Samples of exotic fruits like pitayas (dragon fruit) and passionfruit were also often contaminated (14.1% and 10.6%, respectively), being the ones with the highest percentage of samples exceeding the MRLs (5.9%). Citrus fruits like mandarins, lemons and oranges also had a higher percentage of samples with PIC pesticide residues exceeding the legal limits (3.5% and 4.8%, respectively).

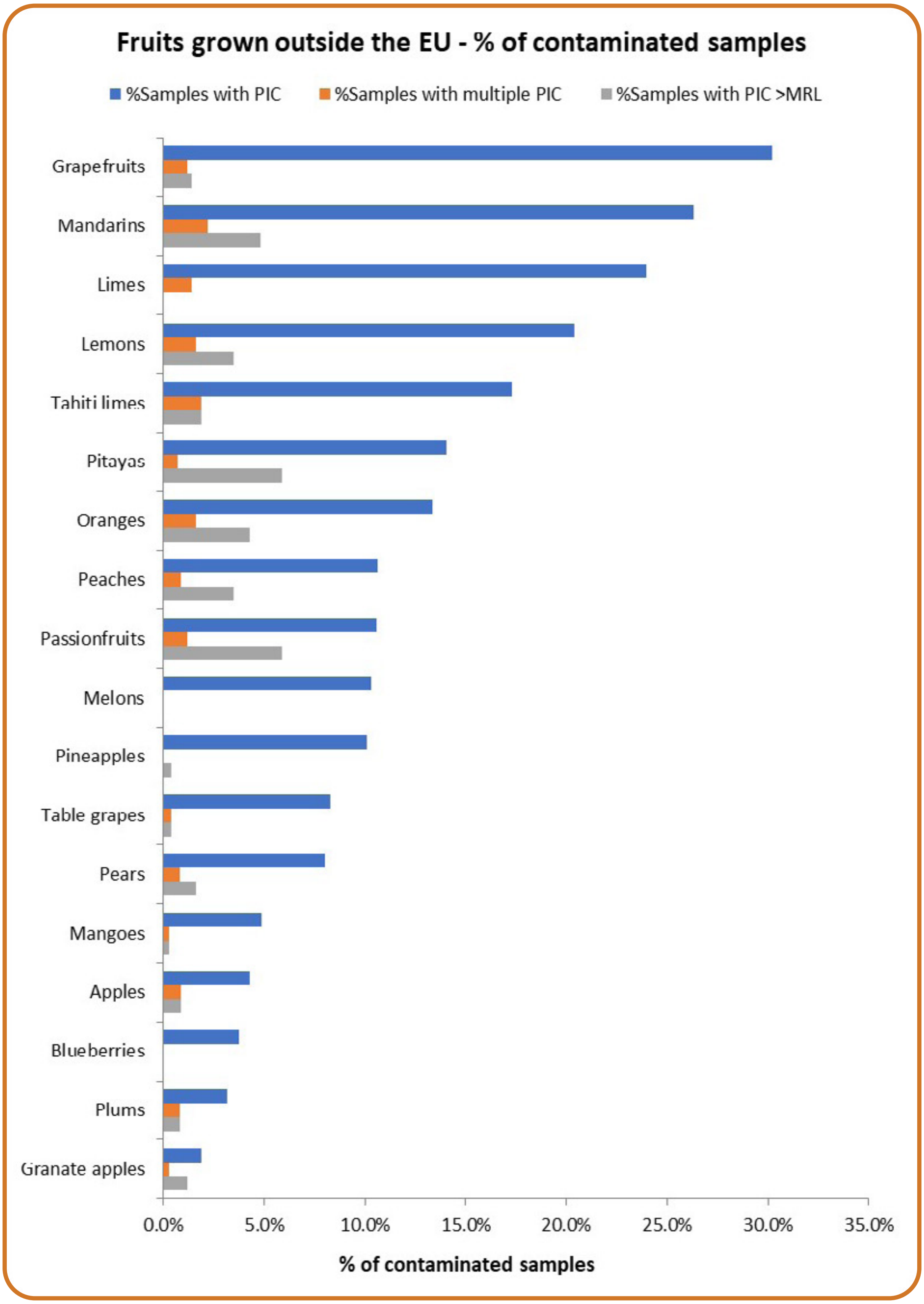

Figure 10. *Most contaminated fruits grown outside the EU*

At a glance:

A higher number of imported fruit samples had residues of EU-banned pesticides compared to EU-grown samples

All citrus fruits show a high contamination rate

Imported fruits present a higher percentage of samples with residues exceeding the MRLs

Fresh vegetables with a chemical seasoning

The EU-grown vegetables with the highest percentage of contaminated samples are plants used to make our recipes tastier. Celery leaves, spring onions, parsley, parsley roots and coriander leaves had contamination rates ranging between 7% and 10%. Coriander leaves, spring onions and parsley also had multiple residues with many samples exceeding the MRLs. Very popular EU-grown products like potatoes, cucumbers, lettuces and tomatoes show a contamination rate between 6.6% (potatoes) and 4.3% (tomatoes) and all these vegetables also present multi-residues and samples exceeding the MRLs. (Figure 11)

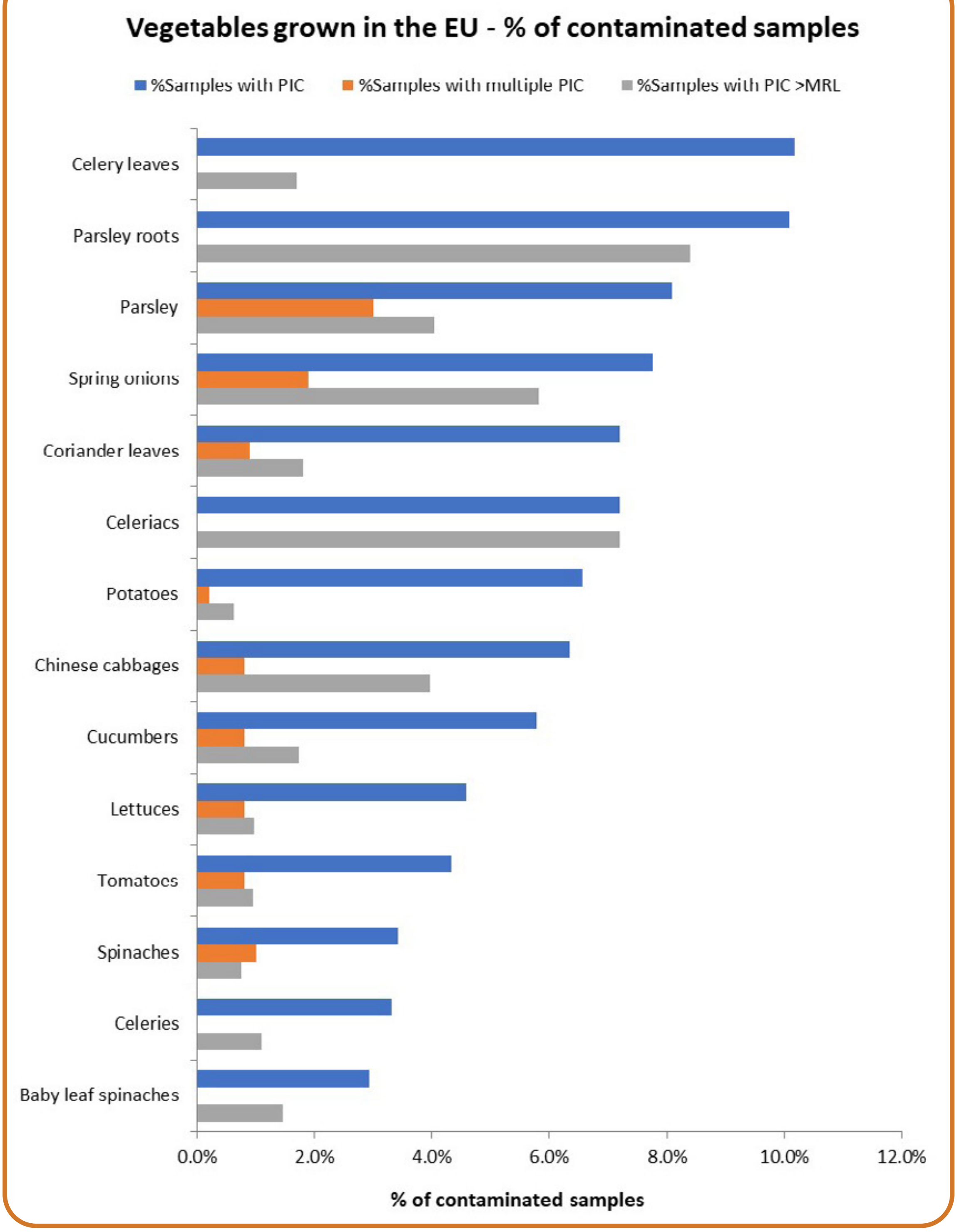

Figure 11. *Most contaminated vegetables grown in the EU*

Once more the situation with imported vegetables is worse compared to the ones from the EU (Figure 12). Popular products like peas, chilli peppers, beans and cucumbers showed contamination with PIC pesticides between 12.5% (cucumbers) and 20% (peas) . They also contained multiple such residues and the percentage of samples exceeding the MRLs ranged from 5% to 10%. Turmeric which is considered a superfood showed a contamination rate of 16% of the samples collected. Ginger, also a superfood, was not much better, with 6% of samples containing PIC pesticides, 2.1% having multi-residues and 4.7% exceeding the MRLs. Everyday vegetables like carrots, potatoes, tomatoes and courgettes are also contaminated, with multi-residues of PIC pesticides found in 4.3% to 6% of potatoes and courgettes, respectively . For avocados, 2.5% of samples had PIC pesticides.

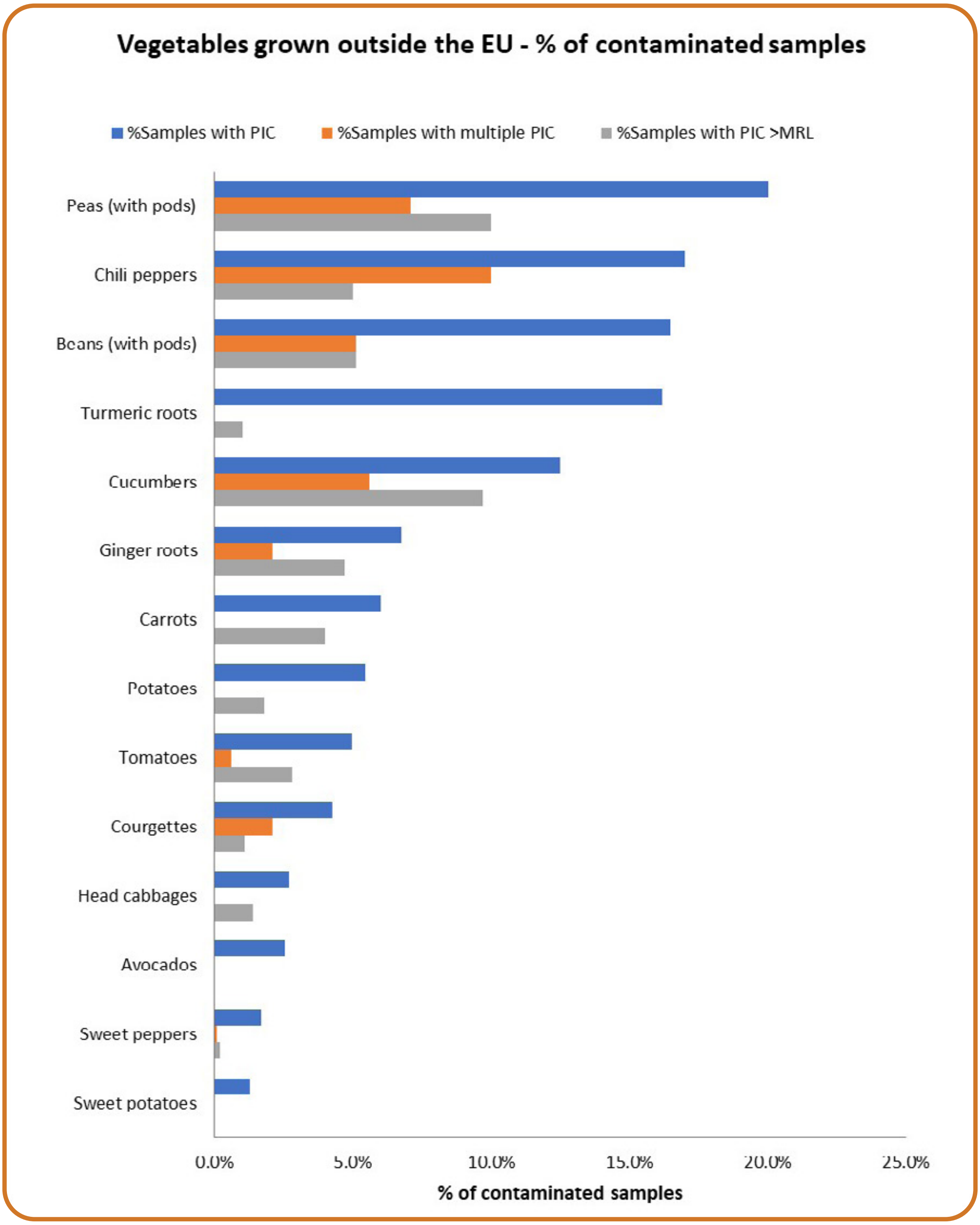

Figure 12. *Most contaminated vegetables and spices grown outside the EU*

At a glance:

Imported vegetables show a higher percentages of contamination compared with vegetables of EU origin

In EU-grown vegetables the percentage of contaminated products can go up to 3% (parsley), while in imported vegetables can reach 10% (chili peppers)

EU vegetables present a higher percentage of samples with residues exceeding the MRLs

Where are the contaminated samples coming from?

Focussing on food grown in the EU, the data collected show that the PIC pesticides residues are not evenly distributed among the Member States, as shown in Figure 13. Portugal, Malta and Poland were on the top of the list, having the highest percentage of PIC-contaminated samples, while Estonia, Finland, Latvia, Luxembourg, Slovenia and Sweden had no PIC pesticide residues detected in their samples. The percentage of samples of food grown in the EU with PIC pesticide residues can be as high as 12.7%.

It is worth noting that a fair comparison is not possible, because as explained in the introduction, every country provides a different number of samples which is neither homogeneous nor proportional to its population. The absence of contaminated samples from a country could also mean that the samples collected weren't enough to find contamination.

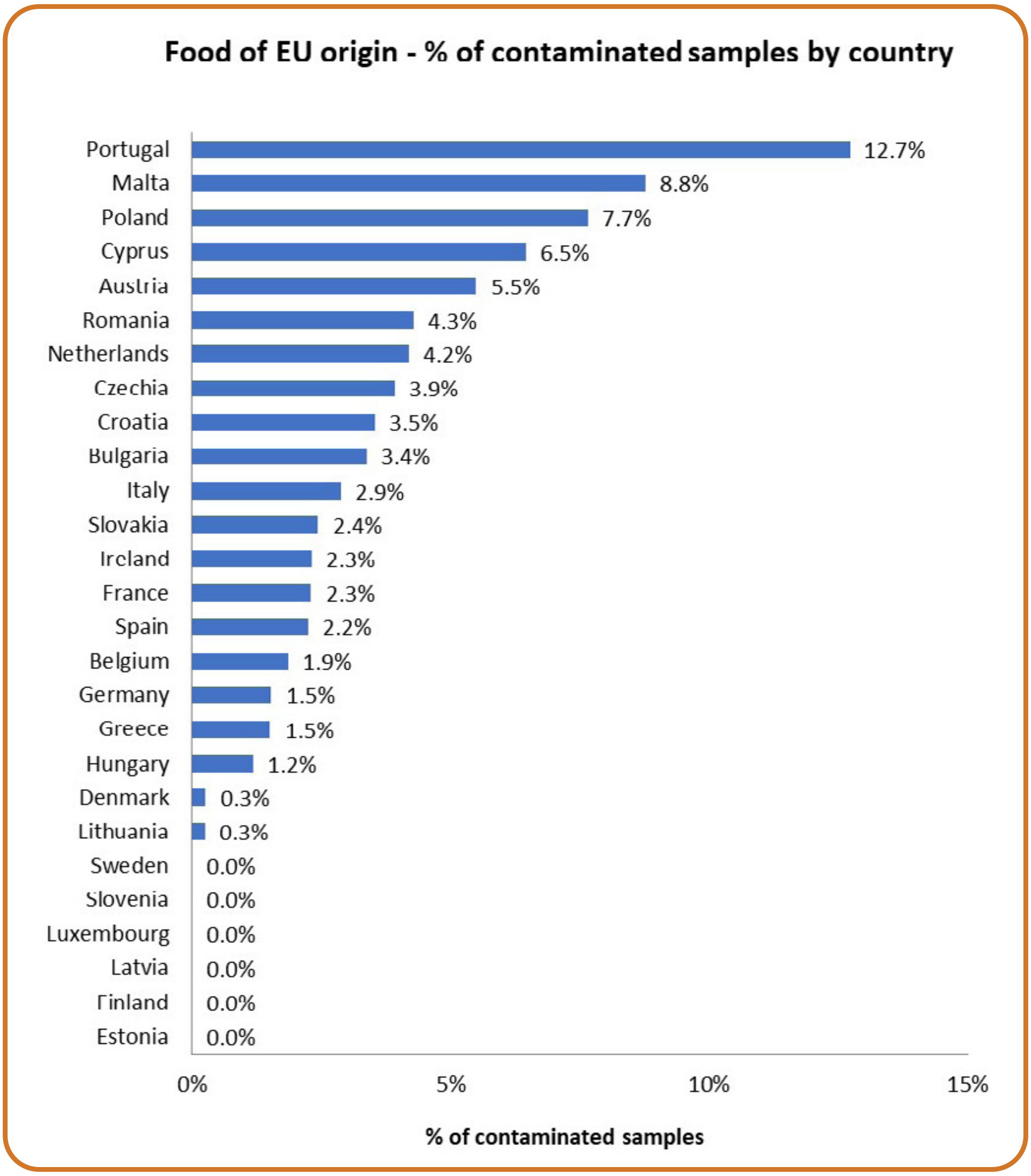

Figure 13. *Percentage of contaminated samples of EU origin by country*

When it comes to imported food (Figure 14), the highest percentage of contaminated samples comes from India, followed by Uganda and China. We can observe that the percentage of contaminated samples is higher in non-EU food samples compared to EU food, with contamination rates reaching up to 23.6 %.

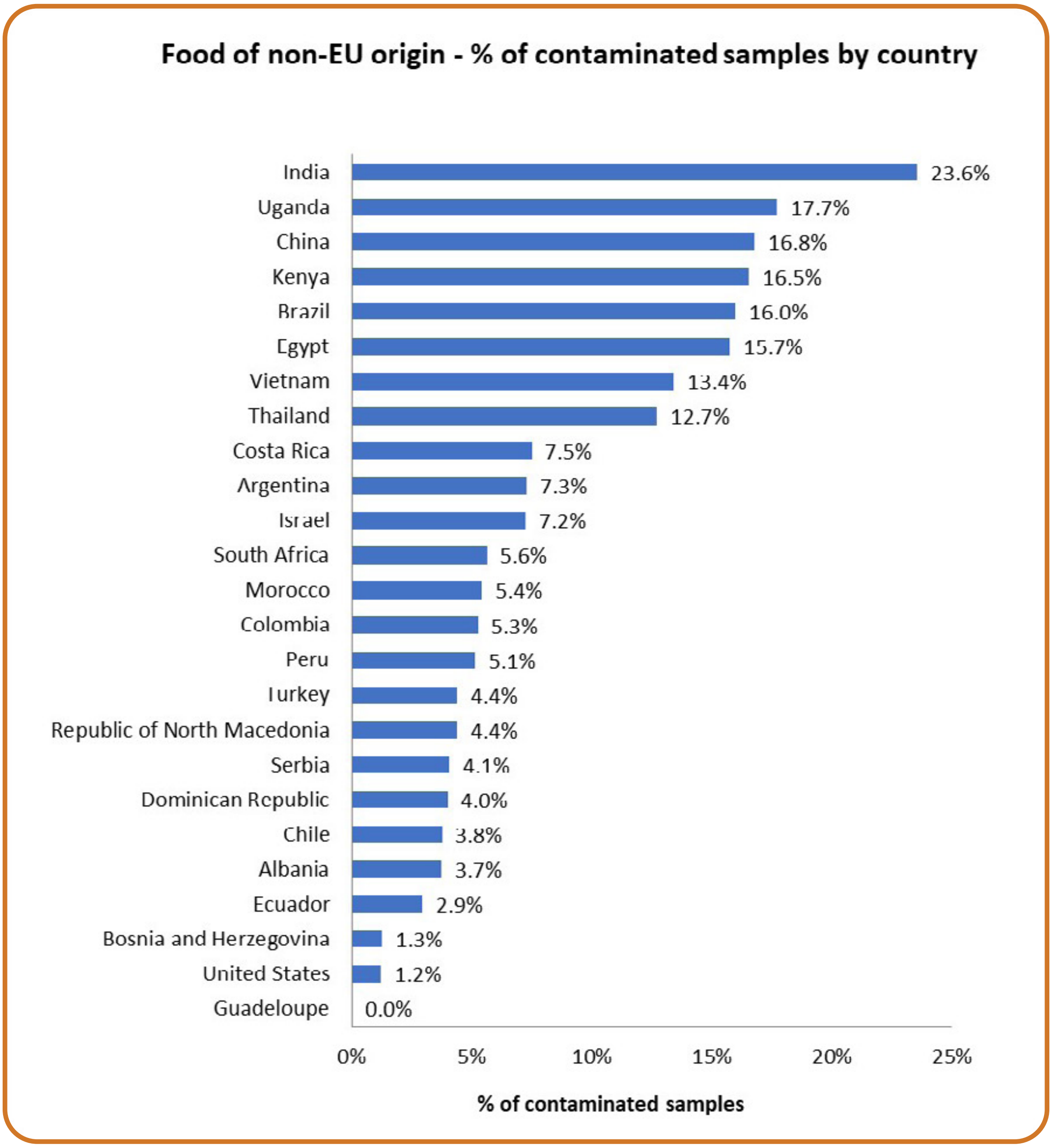

Figure 14. *Percentage of contaminated samples of non-EU origin by country*

At a glance:

The percentage of contaminated samples of food grown in the EU can go up to 12.7%.

The percentage of contaminated samples of food grown outside the EU can go up to 23.6%

The highest percentage of PIC-contaminated samples of EU origin has been found in Portugal, Malta, Poland, Cyprus and Austria.

The highest percentage of imported food contaminated by PIC pesticides comes from India, Uganda, China, Kenya and Brazil

2011-2022: Evolution of PIC contamination in product groups

The analysis of the data collected between 2011 and 2022 allowed us to calculate the trends of PIC contamination for all product groups. (Figure 15)

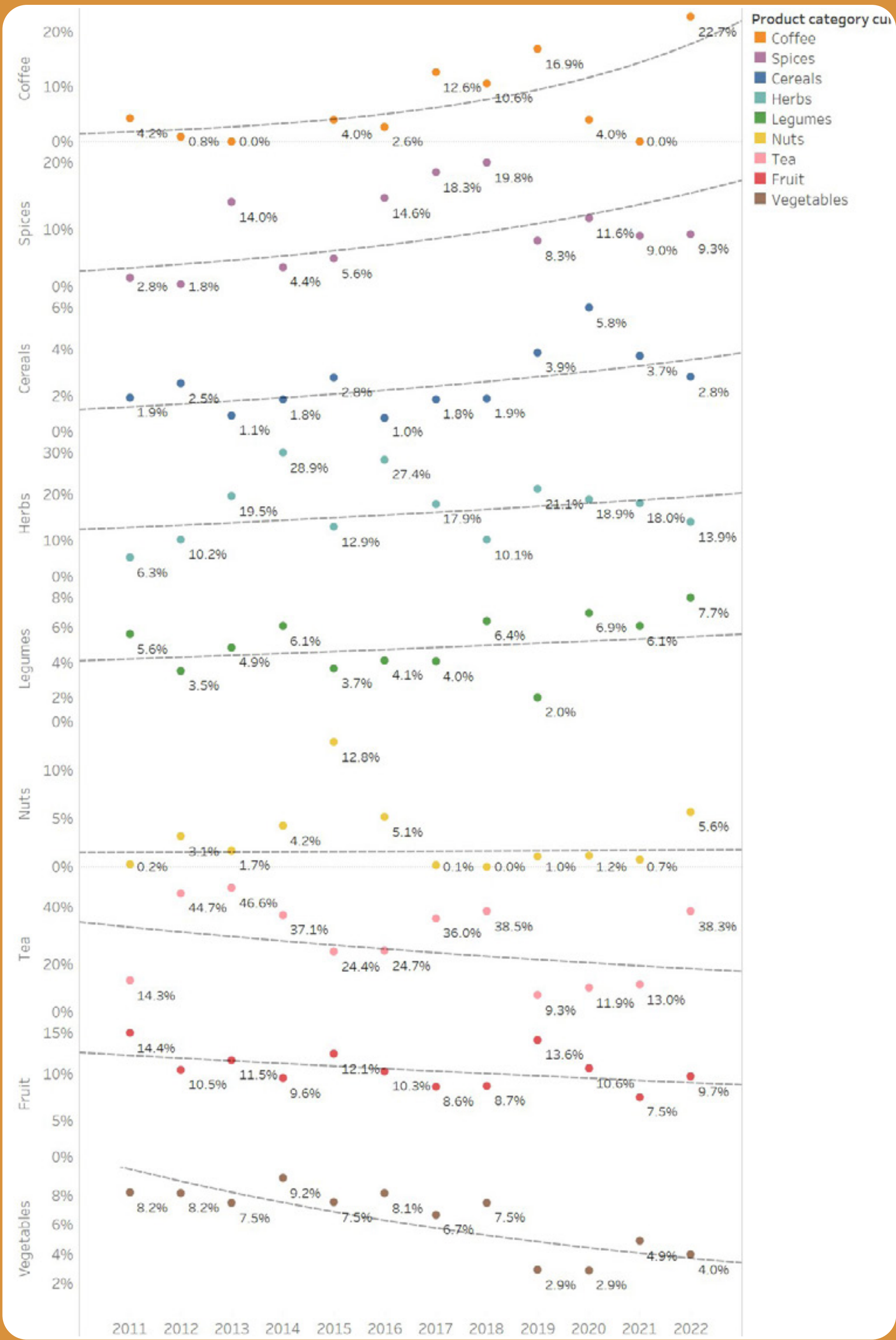

Figure 15. *Average PIC contamination in product groups sampled in EU MS between 2011-2022.*

Changes of percentage of samples with PIC pesticides per product group based on trendlines

Based on the trendlines, the following changes can be calculated (Table 1).

Category	2011 (%)	2022 (%)	Percentual Increase (%)	Increase Indication
Coffee	1.7	17.8	929.6	Very strong increase
Spices	4.2	15.3	259.8	Very strong increase
Cereals	1.5	3.5	135	Very strong increase
Herbs	12.8	19.4	51.8	Strong increase
Legumes	4.2	5.5	30.8	Moderate increase
Nuts	1.5	1.7	16.8	Slight increase
Fruit	12	9.1	-24.4	Slight decrease
Tea	32.9	18.5	-43.8	Strong decrease
Vegetables	9.8	3.7	-62.4	Strong decrease

Table 1. *Percentual changes of PIC contamination per product group between 2011 and 2022 (based on trendlines).*

These findings highlight substantial increases in PIC-pesticides contamination in categories like coffee, spices, and cereals raising concerns about the increasing rates of pesticide contamination in these products. Conversely, decreases in categories like tea, fruit, and vegetables suggest gradual improvements.

PIC pesticides detected

Residues of EU-banned pesticides should not be found at all in EU crops because their use should not be allowed in the EU Member States. However, the data submitted by Member States tells another story.

Among the top ten pesticides detected are the harmful-to-humans carbendazim (mutagenic and reprotoxic), linuron (reprotoxic and suspected carcinogen) and chlorpropham (suspected carcinogen). In addition to these hazardous pesticides, three toxic-to-bees and neurotoxic neonicotinoids (clothianidin, thiamethoxam and imidacloprid) were detected. It is worth highlighting that these neonicotinoids were definitely banned for outdoor uses in 2018 because of their high toxicity to bees.

For some of these prohibited pesticides an MRL has been set for one or more crops while for others the MRL has been deleted and substituted by the default LOD (limit of determination) as shown in table 2 and 3.

PIC Pesticide	Samples with PIC	Status of MRLs
Carbendazim	243	MRLs for citrus, pome, stone fruits - grapes - solanaceae
Chlorate	172	MRLs allowed for almost all the crops
Imidacloprid	91	MRLs requires revision – allowed for several crops
Triflumuron	73	MRLs allowed for soyabeans and animal products
Chlorpropham	61	MRL only for potatoes
Linuron	39	MRL deleted
Thiamethoxam	25	MRLs for several crops, the highest for tea
Malathion	16	MRLs for citrus fruits, lettuces, cereals and herbs
Dimethoate	14	MRLs deleted
Clothianidin	12	MRLs for several crops

Table 2. *Top 10 PIC pesticides found on crops produced in EU MS and sampled in 2022.*

The situation is different for non-EU countries, where the PIC pesticides can be exported upon prior informed consent and are then detected as residues in EU food imported from these countries. This is unacceptable and highlights a double hazard: for farmers and for European consumers.

PIC Pesticide	Samples with PIC	Status
Malathion	374	MRLs for citrus fruits, lettuces, cereals and herbs
Imidacloprid	307	MRLs requires revision – allowed for several crops
Carbendazim	221	MRLs for citrus, pome, stone fruits - grapes - solanaceae
Thiamethoxam	97	MRLs for several crops, the highest for tea
Clothianidin	70	MRLs for several crops
Fenbutatin-Oxide	42	MRLs deleted
Propiconazole	41	MRLs deleted
Chlorfenapyr	39	MRLs deleted
Ethylene Oxide	32	MRLs deleted
Tricyclazole	30	MRLs deleted

Table 3. *Top 10 PIC pesticides found on crops produced OUTSIDE the EU and sampled in 2022*

If we examine the pesticides that were detected in at least 30 samples or more from EU and non-EU countries, we have a list of the top 16 pesticides (Table 4). All of them are not authorised for agricultural use in the EU because they are hazardous for human health (apart from malathion, which is restricted to use in permanent greenhouses). In addition, 13 out of 16 are included in the PAN International Highly Hazardous Pesticide list because they are hazardous for human health and/or the environment. The reasons for being listed as HHPs are summarised in the table below. A table with all the pesticides found in the analysed samples is available in Annex I.

PIC pesticides detected

					Acute toxicity			Long term toxicity										Environmental toxicity			
Pesticide	Import tolerance	Samples with PIC	Samples with PIC residues >MRL	% Samples with PIC residues >MRL	WHO Ia	WHO Ib	H330	GHS Carc 1B	GHS Carc 2	GHS Muta 1B	GHS Muta 2	GHS Repro 1B	GHS Repro 2	EPA Carc	IARC Carc	IARC Prob carc	EPA Prob carc	Very bio acc	Very pers water, soil or sedi-ment	Very toxic to aquatic organism	Highly toxic for bees
Chlorothalonil	MRL deleted	32	32	100.0%			✓		✓								✓				
Fenbutatin-oxide	MRL deleted	43	41	95.3%			✓												✓	✓	
Dimethoate	MRL deleted	32	30	93.8%																	✓
Linuron	MRL deleted	40	36	90.0%					✓			✓									
Tricyclazole *	MRL deleted	32	28	87.5%																	
Propiconazole	MRL deleted	51	43	84.3%								✓									
Chlorfenapyr	MRL deleted	51	25	49.0%																	✓
Thiamethoxam	Tolerance for several crops, the highest for tea	125	24	19.2%																	✓
Chlorpropham	Tolerance only for potatoes	68	13	19.1%					✓												
Clothianidin	Tolerance for several crops	86	16	18.6%																	✓
Chlorate *	MRL not deleted	213	39	18.3%																	
Imidacloprid	MRL not deleted	403	70	17.4%																	✓
Carbendazim	MRLs not deleted	475	45	9.5%						✓		✓									
Ethylene oxide	MRL deleted	32	2	6.3%				✓		✓		✓			✓						
Malathion	MRL not deleted	391	10	2.6%												✓					✓
Triflumuron *	Tolerance only for soya bean 0.1	75	1	1.3%																	

** Pesticides not included in the PAN International HHPs list*

Table 4. *PIC pesticides detected in EU or non-EU samples (at least 30 samples), the number of samples exceeding the MRLs and their hazard classification.*

The criteria and sources used by PAN to identify pesticides considered to be highly hazardous are explained in Annex III.

Focus on France

Overview

The first European country which took an initiative to stop the export of hazardous pesticides is France, recently followed by Belgium. In 2018 indeed, the French government adopted a law that aimed to prohibit the export of banned pesticides from the country. The law entered into force in January 2022.

Even if not perfect, this has been the first attempt to stop an unfair double standard, therefore we decided to focus on the data collected by France.

A general overview shows that EU-banned pesticide residues were detected in French food samples of EU and non-EU origin, but not in all the categories. The highest percentage of contaminated samples was found in spices (11.8%) and legumes (11.1%), while the other categories presented a contamination lower than 4%.

Samples exceeding the MRLs were found in legumes, fruits, cereals and nuts. (Figure 16)

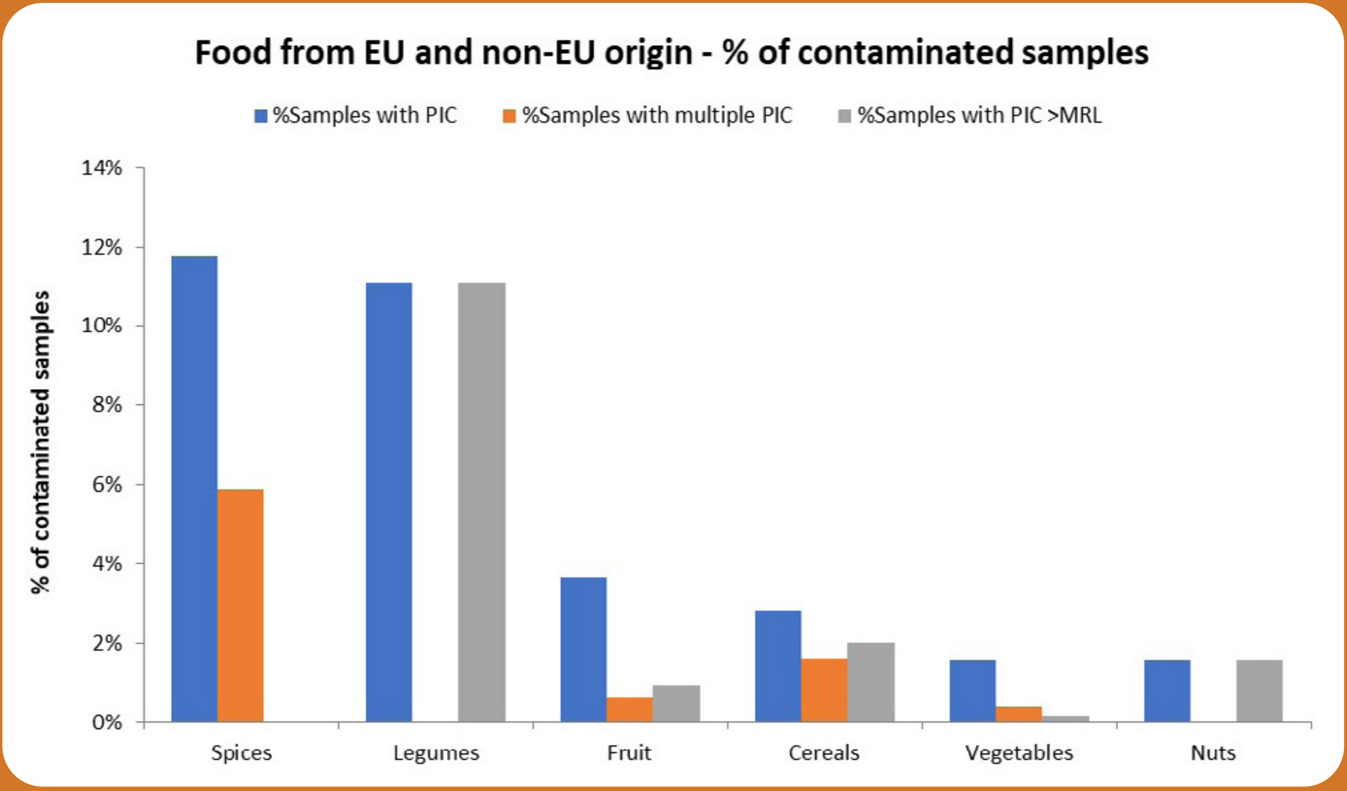

Figure 16. *Percentage of EU and non-EU samples with PIC pesticides divided into different food categories*

Looking more into detail (Figure 17), we see that the highest percentages of samples contaminated by PIC residues were Tahiti limes (16.4%), passion fruits (10%) and plums (4.3%). These fruits, along with cherries and peaches also carried multiple residues, and some of the residues were exceeding the legal MRLs. Residues of PIC pesticides were found as well in all the other samples but not at high rates (up to 3.6%).

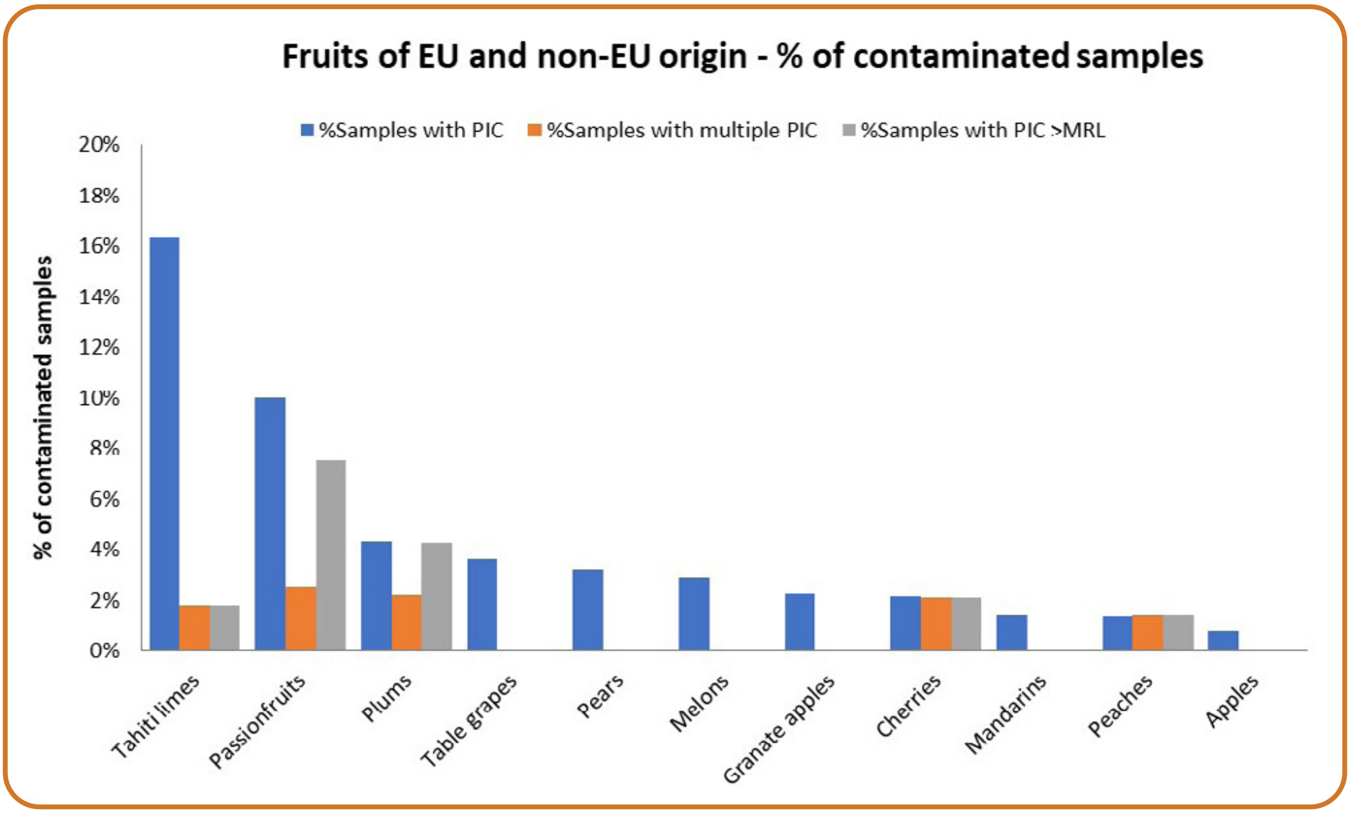

Figure 17. *Most often contaminated fruit samples (EU and non-EU) with PIC pesticides.*

The analysis of vegetables and rice produced within or outside the EU (Figure 18), shows that the highest percentage of contaminated samples was rice (14%), followed by courgettes and plantains (both 8%). Rice, courgettes, butternut squashes and cucumbers carried multiple residues as well. Samples with residues exceeding the MRLs were found in rice (11%).

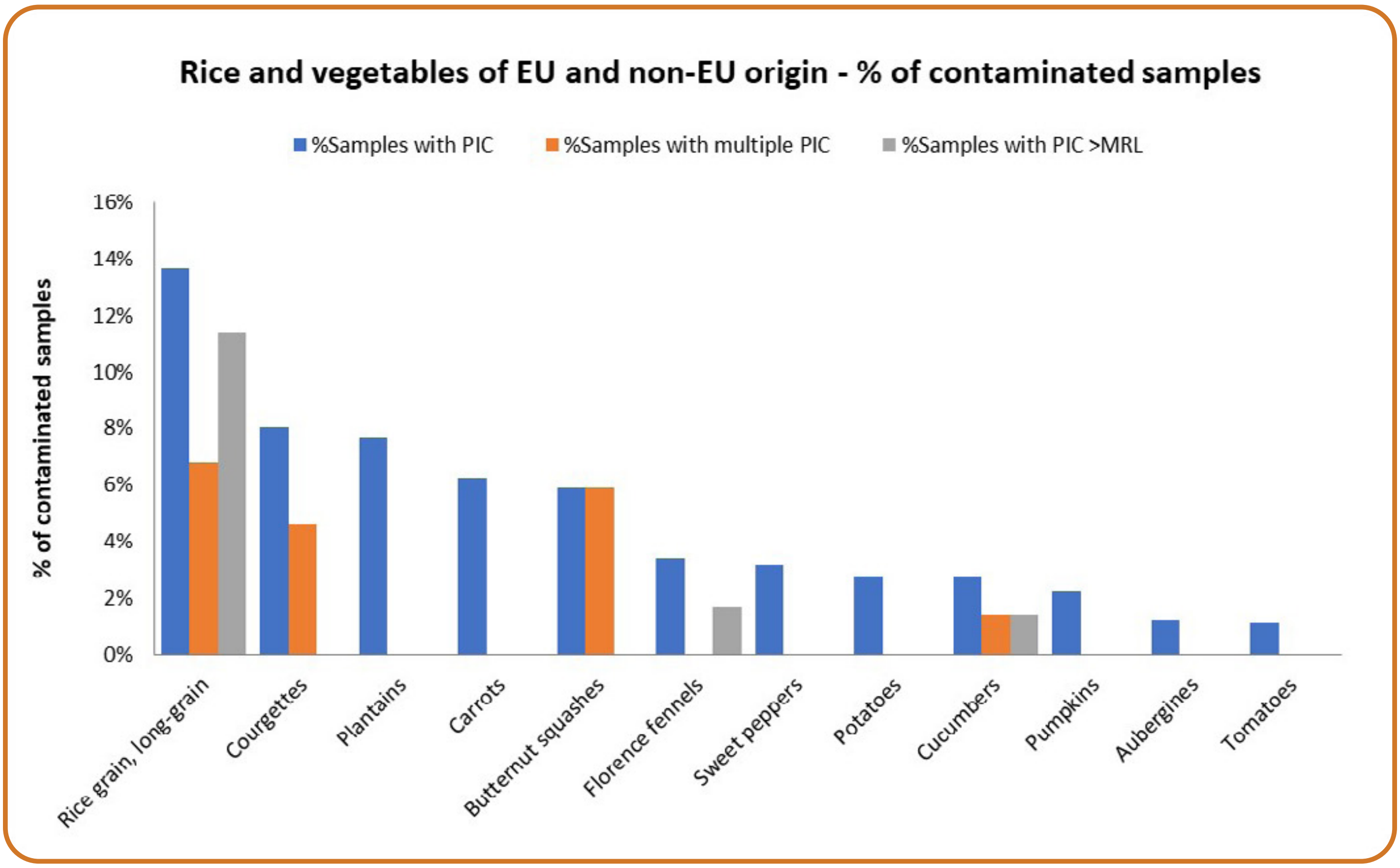

Figure 18. *Most often contaminated vegetables (including rice) with PIC pesticides.*

Where are the contaminated samples in France coming from?

It's interesting to explore where the contaminated samples collected in France are coming from.

Regarding food of EU origin in French food markets (Figure 19), contaminated samples come from France (17 samples), which corresponds to 1% of the total number of French samples collected, followed by Italy (2%), Portugal (6%) and Belgium (3%). Both Italy and France had two samples exceeding the MRL.

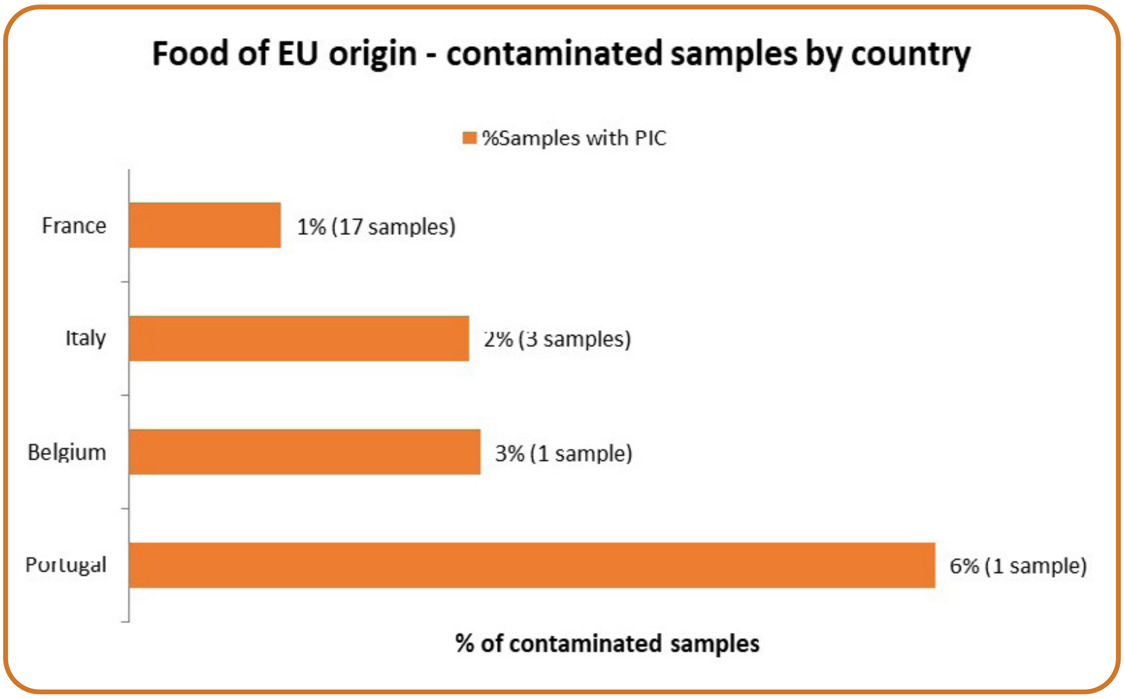

Figure 19. *Contaminated samples from EU origin with EU-banned pesticides (PIC) expressed in %.*

Regarding food of non-EU origin (Figure 20), the highest contamination rates were found in samples from Vietnam (24%), followed by Brazil and Chile, although the number of samples was small. Samples from Vietnam had the highest MRL exceedance rate (17.6%), with four different PICs detected.

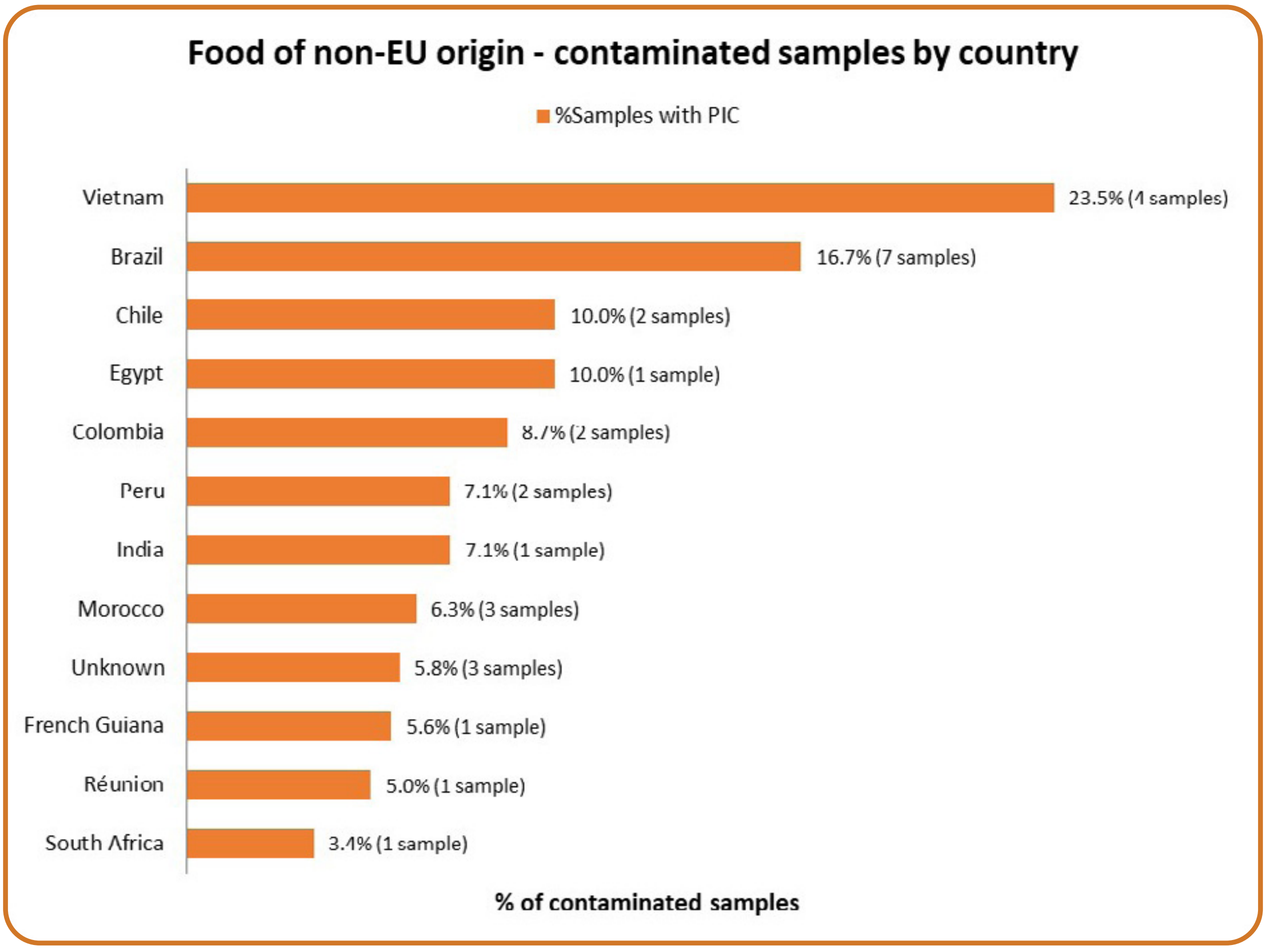

Figure 20. *Contaminated samples of non-EU origin with EU-banned pesticides (PIC) expressed in %*

Contaminated food produced in France

Looking at fruits and vegetables produced in France and collected across all EU Member States (Fig 21) we notice that very popular products, such as potatoes (14%), courgettes (11%) and carrots (8%) had PIC residues (Figure 21). Courgettes, butternuts squashes, cucumbers and cherries had samples with multiple residues.

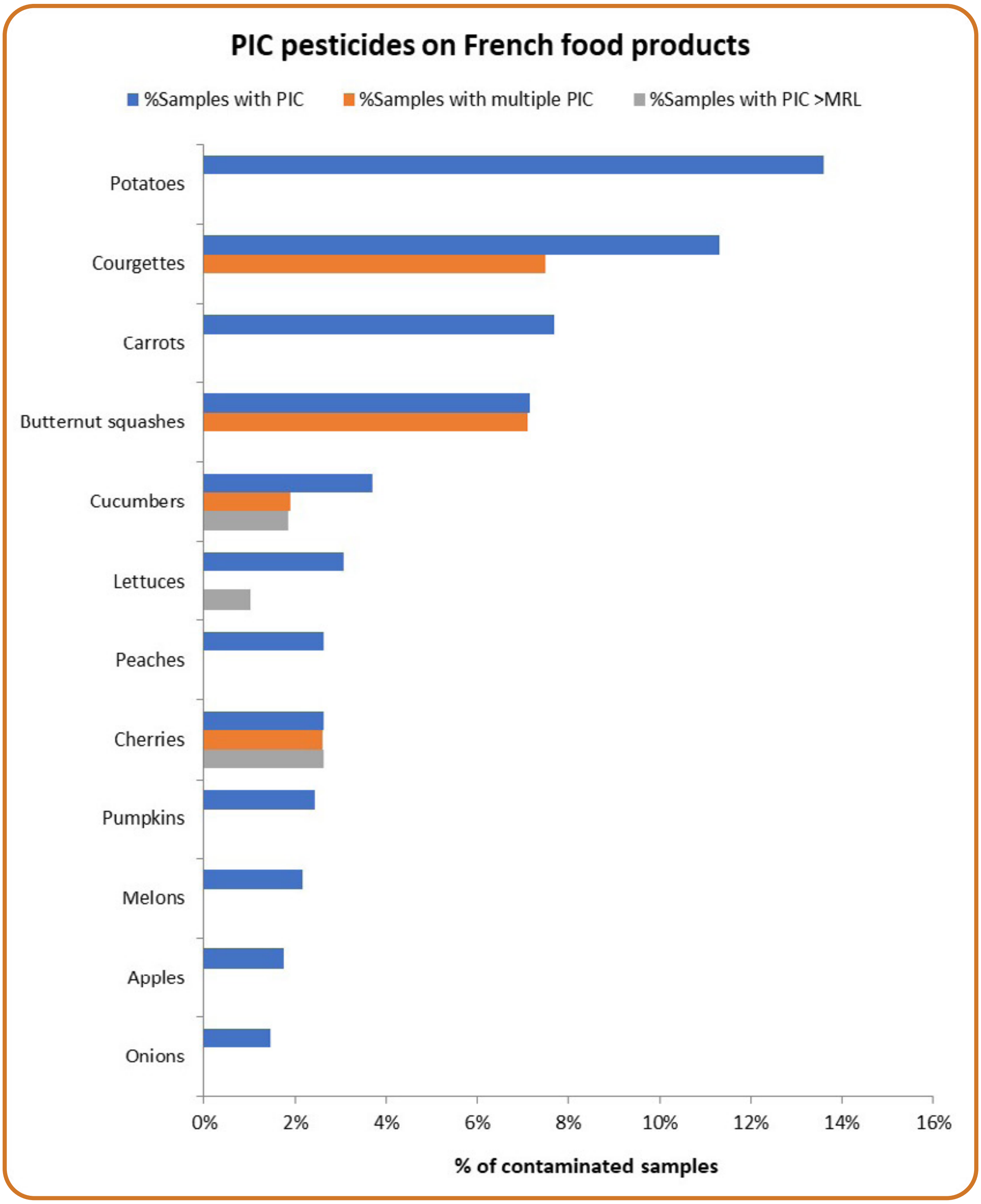

Figure 21. *Contaminated samples of French origin collected in the EU*

Zooming in on the specific pesticides detected in food of French origin reveals the presence, among other pesticides, of residues of aldrin and dieldrin, which are persistent organic pollutants prohibited since the Seventies and are both suspected human carcinogens (Table 5). Even if the number of samples collected was very low, these pesticides were found in butternut squash, cucumbers and courgettes, which are very popular vegetables. The other pesticides detected are also very hazardous for human health or the environment: Carbendazim is mutagenic and toxic for reproduction, chlorpropham is a suspected carcinogen, dimethoate is highly toxic for bees, while omethoate is classified as highly hazardous by the WHO and is also highly toxic for bees.

PIC Pesticide	Product	Country of origin
Carbendazim	Apples	France
Carbendazim	Cucumbers	France
Carbendazim	Melons	France
Carbendazim	Plantains	French Guiana
Carbendazim	Pumpkins	France
Dieldrin	Butternut squashes	France
Dieldrin	Courgettes	France
Dieldrin	Cucumbers	France
Aldrin	Butternut squashes	France
Aldrin	Courgettes	France
Aldrin	Cucumbers	France
Chlorpropham	Potatoes	France
Chlorate	Carrots	France
Dimethoate	Cherries	France
Omethoate	Cherries	France

Table 5. *Residues found on products grown in France*

The range of pesticides found in samples collected in France from all origins is even wider, as shown below, and it includes two neonicotinoids, which are very toxic to bees. (Figure 22)

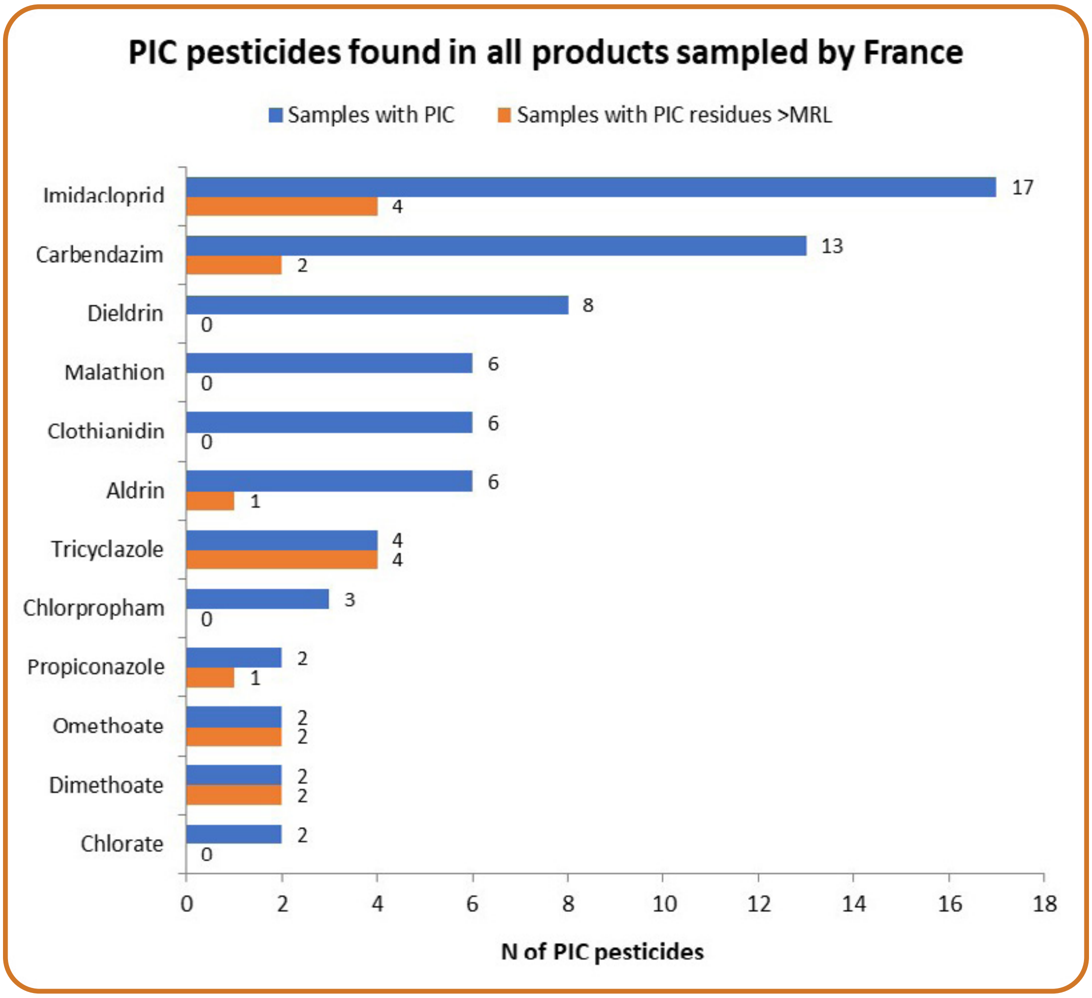

Figure 22. *Pesticides found in samples from all origin*

Use of banned pesticides in the EU and legal residues in food?

Finding residues of PIC pesticides in crops grown in Europe is not justified and highlights a real problem of use of prohibited pesticides in the Member States. This creates an unnecessary and hazardous exposure for farmers, residents of agricultural zones and consumers.

The use of banned pesticides in the production of EU crops: A loophole in the Pesticide Regulation that results in the use of banned pesticides in Europe, is the derogation "emergency situations" (Article 53, Reg 1107/2009). Under this derogation, Member States are allowed to authorise for a period of 120 days the use of a pesticide product, when "such measure appears necessary because of a danger which cannot be contained by any other reasonable means." For example, in cases of an "exotic" pest, which would require the use of a pesticide product that is not authorised in Europe. However, in blatant oversight from the European Commission, Member States abuse this derogation to obtain 'emergency authorisations' for toxic pesticides that have been banned because they can cause harm to human health or the environment. A PAN Europe report found that between 2019 and 2022, 236 derogations were given in total to 14 hazardous substances, and almost half of these derogations (47.5%) were for the use of neonicotinoid substances (clothianidin, imidacloprid, thiamethoxam, Chlorothalonil). Austria was the top user with 20 derogations, Finland came second and Denmark third, while Luxembourg, Bulgaria or Malta gave none for the substances we looked into.

PAN Europe brought the issue of the emergency authorisations to the European Court of justice. The court highlighted that the principal objective of the Pesticide Regulation 1107/2009 is to "ensure a high level of protection of human and animal health and the environment", which should prevail over the objective of improving plant production. Moreover, the EU law is underpinned by the precautionary principle to ensure that this objective is met. Therefore, when Member States are granting authorisations for non-authorised pesticides, they should ensure that the products do not contain active substances that cause harm to human health and the environment. Banned pesticides should not be used to treat seeds either. In addition, Member States should promote low pesticide-input pest management giving wherever possible priority to non-chemical methods.

Following the verdict of the ruling in January 2023, the European Commission is expected to produce a guidance document for EU member states for the use of 'emergency' authorisations, which is still pending. In the meantime, countries like Romania continue to grant such authorisations.

Our findings: Looking into the results, we find that from July 2021 to December 2022, Member states were granted 34 derogations for five of the PIC pesticides detected in European consumers' food (Table 6). Although the data is not detailed enough to carry a thorough evaluation, it cannot be a coincidence that certain Member States gave derogations to the use of neonicotinoid pesticides in their territory and then these were often detected in European food. Prior to the sampling, thiamethoxam received 15 'emergency use' authorisations in 12 Member States, whereas imidacloprid received 12 in five Member States. Both these substances were on the top 10 PIC pesticides detected most often in EU-grown samples. Interestingly, some of these countries (e.g. Austria, Romania, Poland) are among those with highest rates of PIC pesticides in their food samples. In such cases, it is possible to have cross contamination to other crops

PIC Pesticide	N. of derogations	From	To	Countries
Linuron	1	29/08/2022	26/12/2022	GR
Imidacloprid	14	16/08/2021	09/12/2022	BE, DK, FI, FR, RO
Thiamethoxam	15	28/09/2021	11/08/2022	AT, BE, CZ, DK, ES, FI, FR, HR, HU, PL, RO, SK
Thiamethoxam, Tefluthrin	1	01/01/2022	02/06/2022	LT
Clothianidin	1	25/01/2022	24/05/2022	RO
Clothianidin, Beta-Cyfluthrin	2	01/12/2021	30/05/2022	BE, RO

Table 6. *Emergency authorisations given to Member States under Article 53 (Reg 1107/2009) between 2021-2022 in breach of the provisions of the EU law and case law.*

Similarly, the presence of PIC pesticide residues in imported food could in some cases be 'legal' because of loopholes in the current pesticides legislation.

Legal residues of EU banned pesticides in imported food: When a pesticide is prohibited for agricultural use in the EU indeed, it does not automatically result in prohibiting its residues in all food products. This stems from certain regulatory gaps and inconsistencies, but also from a lack of political will to enforce stricter interpretations of the law.

A distinction must be made between substances banned in the EU because of their harmful effects on humans and those that have unacceptable effects on the environment.

Substances banned in the EU for health reasons

The MRL Regulation allows for the possibility of setting MRLs above the Level of Determination (LOD) for substances not approved in the EU for trade purposes but this possibility is restricted.

There are two pathways for setting MRLs for substances banned in the EU. First, import tolerances can be established at the request of parties such as trade partners or pesticide producers. Second, MRLs can be set based on Codex Alimentarius (CXL) values proposed by the FAO/WHO. However, the setting of any MRLs to accommodate trade is tightly regulated by consumer protection requirements.

- Import tolerances can only be set for products where the active substance in question has been banned in the EU for reasons other than human health (Article 3(2)(g) of the MRL Regulation). It should therefore not be possible to apply import tolerances to substances that do not meet the approval criteria of the Pesticide Regulation because they cause harmful effects to humans.

- CXLs have to be considered when developing or adapting food law in the EU, except in cases where those international standards would be ineffective or inappropriate for achieving the EU's food safety objectives. They may also be excluded if there is scientific justification or if they would result in a lower level of protection from the one determined as appropriate in the EU (Article 5(3) of Regulation 178/2002).

Since the entry into force of the Pesticide Regulation in 2011, the protection standard from substances that meet one of the 'cut-off' criteria for humans (CMRs and ED) has been to ensure no human exposure **to detectable residues in food**. This means that MRLs should be set at the default value of 0.01 mg/kg or the relevant LOD (points 3.6.2 to 3.6.5 of Annex II of the Pesticide Regulation). Yet, the Commission disregards this hazard-based requirement when allowing residues of these substances, on the ground that EFSA has identified a so-called 'safe level' of exposure for consumers. This runs counter to the EU's objectives of ensuring that imported products comply with the same standards as European products.

Substances banned in the EU for environmental reasons: regulatory gap

While the purpose of the MRL Regulation is consumer safety, it does not take environmental protection into account. Consequently, MRLs for substances banned for environmental reasons within the EU may still be upheld if trade demands it. This is a major regulatory gap that needs to be addressed by regulators. Authorising residues of these substances of high environmental concern has serious implications. First, the EU is tacitly endorsing the continued use of these toxic pesticides abroad and the resulting environmental contamination. Second, this creates a clear double standard. EU farmers, bound by the pesticide regulation, rightfully can no longer use these dangerous pesticides. This places them at a competitive disadvantage.

Recent developments

The European Commission, under its 2020 Farm to Fork Strategy, expressed an intention to address this issue by:

- Reviewing import tolerances for substances meeting the Pesticide Regulation's cut-off criteria, especially those presenting a high risk to human health;
- Considering environmental factors in future assessments of import tolerances for substances no longer approved in the EU, while still adhering to WTO standards.

In 2022, a first Regulation deleted the MRLs of two neonicotinoids, clothianidin and thiamethoxam based on environmental grounds starting from 2026. Despite this progress, the European Commission has not fully shifted its approach, as residues of EU-banned pesticides that are of global environmental concern continue to be allowed for trade purposes, contradicting the Pesticide Regulation's intent of no detectable residues.

Our findings: Allowing pesticides of such residues in food increases the risk that these chemicals reach the diet of European consumers and these might exceed the MRLs. An examination of the MRLs for the pesticides listed under the PIC regulation reveals that 60 prohibited pesticides still have MRLs set in certain food products above the limit of determination (LOD; default 0.01 mg/kg). Out of those 60 PIC pesticides, 36 were detected in the samples analysed and 24 of these exceeded the MRLs.

When we look at all the 69 PIC pesticides found in our study, 53 exceeded the permitted MRLs while only 14 had residues at or below the official MRLs.

Among the 60 pesticides with certain MRLs above the limit of detection/determination (MRLs not deleted), nine have been banned because they fall under the hazard cut-off criteria, meaning they are, or are presumed to be, carcinogenic or mutagenic or toxic for reproduction, or POP and therefore hazardous to human health. Out of them five of them have been found in the food samples collected in 2022, as shown in the table below. (Table 7)

Pesticide	Toxic effects	Residues found in 2022
Aldrin	Suspected to be Carcinogenic POP Environmental	✓
Binapacryl	Toxic to reproduction - REPR 1B Very toxic to aquatic life with long lasting effects harmful if swallowed - harmful in contact with skin	✓
Carbendazim	Mutagenic - MUTA 1B Toxic to reproduction - REPR 1B Very toxic to aquatic life - long lasting effects	✓
Cyproconazole	Toxic to reproduction - REPR 1B Toxic if swallowed Very toxic to aquatic life with long lasting effects	
Diazinon	Presumed human carcinogen - CARC 1B Suspected to be mutagenic - MUTA 2 Harmful if swallowed Very toxic to aquatic life - long lasting effects	✓
Dieldrin	Suspected to be Carcinogenic - CARC 2 - POP Fatal in contact with skin - toxic if swallowed - Chronic toxicity Very toxic to aquatic life with long lasting effects	✓
Hexachlorobenzene	Presumed human carcinogen - CARC 1B - POP Chronic toxicity Very toxic to aquatic life with long lasting effects	
Isopyrazam	Suspected to be Carcinogenic - CARC 2 Toxic to reproduction - REPR 1B Very toxic to aquatic life with long lasting effects	
Mancozeb	Suspected to be Carcinogenic - CARC 2 Toxic to reproduction - REPR 1B Very toxic to aquatic life with long lasting effects Chronic toxicity - may cause allergic skin reaction	

Table 7. *Pesticides that have been banned because they meet the hazard-based cut-off criteria*

Hence there are five pesticides prohibited because they meet the hazard-based cut-off criteria and are still 'legally' invited at our table.

The whole list of PIC pesticides which have an MRL can be found in Annex II.

Discussion

Banned Pesticides in our food

The analysis of the official data collected in 2022 by Member States and published by EFSA in 2024 reveals a concerning reality: despite the EU's ban on certain pesticides in the EU, their residues continue to be detected in food samples, irrespective of their origin.

Finding residues of PIC pesticides in imported food is concerning but can be explained: hazardous pesticides banned in the EU are still produced and exported to third countries with weaker safety regulations. These countries use them and then export food that carries these residues back to the EU. Similarly, the presence of such residues in EU-produced crops is unacceptable and can be partially attributed to the 'illegal' use of the 'emergency situation' derogation by Member States, where they request to receive authorisations for the use of banned pesticides.

Many of the PIC pesticides found in EU-grown food were banned over a year before the samples were taken. The only exception was Imidacloprid, whose grace period extended until July 2022, with its use restricted to greenhouses.

Fruits and vegetables grown in the EU, ubiquitous on our plates, carry residues of these banned pesticides. Even if the percentage of contaminated samples is not very high, these products are consumed daily, exposing EU citizens to a continuous intake of hazardous chemicals that bear carcinogenic, mutagenic, repro-toxic, neurotoxic or endocrine disrupting properties. For the latter, the scientific community argues that such hazardous substances should have no safe threshold of exposure[9]. In addition, fruits and vegetables are central to a balanced diet, with medical professionals recommending at least five portions a day. If these essential foods are contaminated, the benefits of such a diet are greatly compromised.

In EU-grown food there are not only residues of recently banned pesticides (e.g. triflumuron, toxic-to-reproduction chlorpropham and linuron or bee-killing neurotoxic pesticides like thiamethoxam, imidacloprid and clothianidin), but also residues of old persistent organochlorines (e.g. aldrin and dieldrin). The presence of such pesticides could be due to their high persistence in the soil, but it could also indicate the continued illegal use of these highly hazardous substances at the time of sample collection.

The detection of residues of certain EU-banned pesticides in EU crops (e.g. linuron & neonicotinoid pesticides), could be partially explained by Member States authorising their use via the 'emergency situation' derogation of the EU Pesticides Regulation. For example, prior to the sampling, thiamethoxam received 15 'emergency use' authorisations in 12 Member States, while imidacloprid received 12 such authorisations in five Member States. However, this practice violates EU law, as clarified by the European Court of Justice, in the case brought by PAN Europe. Pesticides banned because they are hazardous must not be authorised under this derogation. These pesticide substances have no place in European agriculture and should not appear in consumers' food.

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[9] Joint Research Centre, 2013. https://publications.jrc.ec.europa.eu/repository/bitstream/JRC83204/lb-na-26-068-en-n.pdf

The situation is even more alarming in imported food, where dangerous pesticides such as mutagenic carbendazim and bee-killing neurotoxic pesticides are found at higher contamination rates than in EU- grown crops. This is largely because pesticides prohibited for agricultural use in the EU can still be produced, exported and used in third countries, which then send their contaminated crops back to Europe. The percentage of samples with multiple residues of banned pesticides is also considerably higher compared to EU crops.

Among the most frequently contaminated products were tea, coffee, spices and herbs. This means that every time that we treat ourselves with a relaxing drink or want to add flavour to our meals, we may be unknowingly increasing our exposure to toxic chemicals. This turns what should be a moment of relaxation into a potentially dangerous habit. Even products marketed as "superfoods", like ginger, turmeric, legumes and avocados, are contaminated, misleading consumers into thinking they are making healthy choices, when in reality, they are consuming contaminated food.

Furthermore, a consistent number of samples -both from within and outside the EU- contained multiple pesticide residues. This is a serious issue, as the effects of pesticides are typically studied in isolation, while the 'cocktail effect' -the additive or synergistic action of multiple pesticides - remains insufficiently investigated. These mixtures are not yet regulated, and their combined effects have not been taken into due consideration.

We also zoomed in on France, which has taken the lead in stopping the export of hazardous pesticides, to assess whether this commitment has an impact on the French consumer goods. Some active ingredients known to be very harmful for human health and the environment were found in certain food products. Alarmingly, residues of aldrin and dieldrin- persistent organic pollutants banned since the 70s and both suspected human carcinogens- were detected. Although the number of contaminated samples is low, these pesticides were found on popular vegetables like butternut squash, cucumbers and courgettes. Whether the contamination is because of illegal use or because of their persistence into the environment it's unacceptable that these toxic substances are found in our food more than 40 years after their ban.

The detection of other prohibited pesticides in French crops mirrors the concerning trend across Europe, indicating that hazardous pesticides were still in use at the time of the sampling, despite their ban. This poses an unnecessary risk to both farmers and consumers that must be urgently addressed. France's decision to stop exporting hazardous pesticides is a positive step, but this must be extended across the entire EU. Nevertheless, it is necessary to stop the exports of EU banned pesticides all across Europe and delete the MRLs in all food items whether produced within or imported to the EU.

Health implications

A substantial body of scientific literature links the use of pesticides (whether banned or authorised) to the development of diseases and adverse health effects in humans. These impacts primarily affect farm workers who handle pesticides, but also extend to their families, and residents in agricultural areas. The observed adverse effects range from various types of cancers[10], to reproductive and neurotoxic adverse effects[11], including in children[12].

In relation to exposure from pesticides in food, scientific studies indicate that this is an important route of exposure for European citizens. People who consume conventional diets have much higher levels of synthetic pesticide residues in their urine[13]. Emerging evidence suggests that this could be linked to health effects. For example, children that started consuming organic food had less exposure to pyrethroid and neonicotinoid pesticides and, over time showed lowered biomarkers of oxidative stress and inflammation[14].

Many of these health risks were already highlighted in a study commissioned by the European Parliament[15], which led to the endorsement of the EU Pesticides Regulation in 2009 to ensure 'a high level of protection.' Under the EU law, pesticides are banned because it is proven that they can have serious health effects on farmworkers, residents and consumers. For many of these chemicals (e.g. mutagens, carcinogens, toxic to reproduction and endocrine disruptors), the EU Pesticides Regulation has a "cut-off" policy, meaning they should be banned and no residues should be found in food. For other hazardous substances, the law is guided by the precautionary principle, requiring the Commission and Member States to take strict measures to protect human health and the environment, especially for vulnerable groups like children and pregnant women.

Our study shows that this is not always the case. The European Commission and Member States, based on the work of EFSA, repeatedly permit residues of banned pesticides to be detected in food to please trade partners. Worryingly, the "safe" levels are often based on studies submitted by the pesticide industry that are not sensitive enough to detect low-dose adverse effects, especially those relevant for children or to assess endocrine disruption

[10] Bassil et al 2007. Cancer health effects of pesticides: systematic review. Can Fam Physician. 53(10):1704-11.

[11] Sanborn et al 2007. Non-cancer health effects of pesticides: systematic review and implications for family doctors. Can Fam Physician. 53(10):1712-20.

[12] Tartaglione et al. 2024. The contribution of environmental pollutants to the risk of autism and other neurodevelopmental disorders: A systematic review of case-control studies. Neurosci Biobehav Rev. 164:105815. doi: 10.1016/j.neubiorev.2024.105815.

[13] Rempelos et al 2022. Diet and food type affect urinary pesticide residue excretion profiles in healthy individuals: results of a randomized controlled dietary intervention trial. Am J Clin Nutr;115(2):364-377. doi: 10.1093/ajcn/nqab308

[14] Makris Ket al, 2019. A cluster-randomized crossover trial of organic diet impact on biomarkers of exposure to pesticides and biomarkers of oxidative stress/inflammation in primary school children. PLoS One;14(9):e0219420. doi: 10.1371/journal.pone.0219420

[15] Blainey et al 2008. The benefits of strict cut-off criteria on human health in relation to the proposal for a Regulation concerning plant protection products. Study commissioned to Milieu Ltd by the European Parliament's Committee on the Environment, Public Health and Food Safety. (Contract: IP/A/ENVI/FWC/2007-057/C1/SC2) [link].

and neurotoxicity. Additive or synergistic effects with other pesticides or chemicals are also not taken to account. Therefore these "safe" levels are assumptions based on inadequate methods to address the risk for the general population.

For pesticides banned due to their environmental toxicity, such as the bee-toxic neonicotinoid pesticides, recent research shows that these substances are also toxic to children. Indeed, neonicotinoid pesticides can pass through blood-brain and placenta barriers[16], and have been detected in children, not only in urine and plasma but also in cerebrospinal fluids[17]. This is concerning, as neonicotinoids can damage neurons in mammals, and affect the developing brain[18].

Our study found that neonicotinoids are within the top 10 pesticides detected in plant-based food sold in the EU market (whether EU-grown or imported), exposing consumers unknowingly to dangerous pesticides that can reach their brain. The detection of these residues in food is particularly important for pregnant women, babies and children, since neonicotinoids might affect brain development. It is unacceptable that these pesticides are banned, yet consumers continue to be exposed to them either because the EU continues to give 'emergency use' authorisations to European farmers or because it permits residues of these pesticides in imported food.

[16] Passoni et al 2021. An integrated approach, based on mass spectrometry, for the assessment of imidacloprid metabolism and penetration into mouse brain and foetus after oral treatment. Toxicology;462:152935. https://doi.org/10.1016/j.tox.2021.152935

[17] Laubscher et al, 2022. Multiple neonicotinoids in children's cerebro-spinal fluid, plasma, and urine. Environ Health 21, 10. https://doi.org/10.1186/s12940-021-00821-z

[18] Kimura-Kuroda et al 2012. Nicotine-Like Effects of the Neonicotinoid Insecticides Acetamiprid and Imidacloprid on Cerebellar Neurons from Neonatal Rats. PLOS ONE 7(2): e32432. https://doi.org/10.1371/journal.pone.0032432

Conclusions

The results presented in this report highlight that the European pesticides legislation, despite being considered the most protective in the world, contains contradictions and serious loopholes that need to be addressed urgently.

The detection of residues from pesticides in EU food that have been banned for use in Europe because of their toxicity is alarming. This indicates that these pesticides have been used illegally in Europe, and in some cases Member States have 'unlawfully' triggered 'emergency situations' to continue their use despite being banned because of their high toxicity. Regardless of the crop type or residue concentration, these pesticides should not be used in the EU, and therefore, they should not be found as residues in EU food—whether their levels are within or exceed MRLs. Equally troubling is the higher contamination rate in imported food, revealing the widespread use of these toxic substances in third countries. This is driven by the EU giving its consent to the toxic trade, allowing banned pesticide substances to be produced in Europe only to be exported.

This EU double standard is neither fair nor safe. The fact that pesticides banned in the EU are exported and used in third countries raises significant ethical concerns, as it jeopardises the health of farmers, local communities, and ecosystems abroad. The EU is turning a blind eye on the consequences of their use in importing countries, devaluing the health and the environmental impacts in those nations. In addition, this practice highlights a lack of consideration of the European consumers' health, as the residues are present on the imported food and in some cases are legally permitted due to requests aiming to support international trade. Finally, importing food with EU-banned pesticides also disadvantages EU farmers, who must rightfully comply with stringent pesticide regulations, while the EU does not apply the same restriction to imports from less-regulated countries. The failure to automatically delete MRLs for banned pesticides further prioritises trade interests over public health and environmental safety.

The fact that pesticides deemed too hazardous for use in the EU are still being produced, used 'illegally' in Europe, or exported and re-imported as residues in the food we consume daily represents a failure to protect the right to health. Nowadays, consumers are unknowingly exposed to dangerous pesticides, and support financially -with their tax money- the trade of these hazardous substances endangering local communities and ecosystems in third countries.

In light of the findings of this report, we strongly urge the EU to take immediate action to put an end to this double standard. The practice of exporting hazardous pesticides must end, and the importation of food containing residues of banned substances must be prohibited. The health of EU citizens and people in exporting countries must take precedence over trade and industrial profits.

Policy demands

In light of the finding of this report, PAN Europe urges EU legislators and policymakers to take the following actions:

- **End the production and export of EU-banned hazardous pesticides:** By being a global leader for the protection of people's health, biodiversity and natural resources worldwide, the European Commission, with the support of the European Parliament and Council must establish legal measures to stop the production and export of hazardous pesticides once they are banned for use in Europe.

- **National bans on the production and export of banned pesticides:** Member States should enact national legislation to stop the production and export of pesticide substances that have been banned at national level because of health and environmental concerns, including any products containing these substances.

- **Delete MRLs for banned pesticides:** The Member State authorities and the Commission to automatically delete the MRLs for all pesticides banned in the EU for health and environmental concerns. Adopt a 'zero tolerance' approach for such residues in food, by making any necessary regulatory amendments.

- **End the misuse of 'emergency situations' by Member States:** The Commission and Member States must update the guidance document on 'emergency situation' authorisations to explicitly incorporate the European Court of Justice ruling, ensuring that hazardous pesticides cannot be used after they have been banned in Europe.

- **Improve data collection and transparency:** Improve the system of data collection for pesticide residues in food to ensure that Member States collect a minimum amount of samples for each category and to allow comparison between countries and between food products.

- **Address the double standards in all EU exports:** Recognising that this double standard extends beyond hazardous pesticides, and it's seen in toys, disposable plastics, cadmium batteries, and other commercial goods deemed unsafe for use in the EU, the EU must create a horizontal Regulation to prevent the export of such good in third countries with weaker protection laws.

Annex I PICs found in all products sampled by EU MS in 2022

N.	PIC Pesticide	Samples with PIC	Samples with PIC residues >MRL	%Samples with PIC >MRL	WHO 1a	WHO 1b	POP	Carc. 1B	Carc. 2	Muta. 1B	Muta. 2	Repr. 1B	Repr. 2
1	Carbendazim	475	45	9.5%						■		■	
2	Imidacloprid	403	70	17.4%									
3	Malathion	391	10	2.6%									
4	Chlorate	213	39	18.3%									
5	Thiamethoxam	125	24	19.2%									
6	Clothianidin	86	16	18.6%									
7	Triflumuron	75	1	1.3%									
8	Chlorpropham	68	13	19.1%					■				
9	Chlorfenapyr	51	25	49.0%									
10	Propiconazole	51	43	84.3%								■	
11	Fenbutatin-Oxide	43	41	95.3%									
12	Linuron	40	36	90.0%					■			■	
13	Chlorthalonil	32	32	100.0%					■				
14	Dimethoate	32	30	93.8%									
15	Ethylene Oxide	32	2	6.3%				■		■		■	
16	Tricyclazole	32	28	87.5%									
17	Omethoate	23	22	95.7%		■							
18	Acephate	22	22	100.0%									
19	Diazinon	22	0	0.0%									
20	Fenvalerate	21	8	38.1%									
21	Cyfluthrin	17	1	5.9%		■							
22	Fipronil	17	3	17.6%									
23	Methamidophos	16	16	100.0%		■							
24	Permethrin	14	4	28.6%									
25	Didecyldimethylammonium chloride	11	1	9.1%									

PICs found in all products sampled by EU MS in 2022

N.	PIC Pesticide	Samples with PIC	Samples with PIC residues >MRL	%Samples with PIC >MRL	WHO 1a	WHO 1b	POP	Carc. 1B	Carc. 2	Muta. 1B	Muta. 2	Repr. 1B	Repr. 2
26	Fenpropathrin	11	3	27.3%									
27	Iprodione	11	10	90.9%									
28	Propargite	11	8	72.7%									
29	Aldrin	10	3	30.0%									
30	Dieldrin	10	0	0.0%									
31	Diphenylamine	10	0	0.0%									
32	Glufosinate (ammonium)	10	1	10.0%									
33	Methomyl	10	10	100.0%									
34	Pymetrozine	10	6	60.0%									
35	Flufenoxuron	7	0	0.0%									
36	Anthraquinone	6	5	83.3%									
37	Procymidone	6	6	100.0%									
38	Carbaryl	5	2	40.0%									
39	Ethion	5	2	40.0%									
40	Dicofol	4	1	25.0%									
41	Binapacryl	3	0	0.0%									
42	Carbofuran	3	3	100.0%									
43	Cyhalothrin	3	3	100.0%									
44	DDT	3	0	0.0%									
45	Dicloran	3	3	100.0%									
46	Quintozene	3	0	0.0%									
47	Alachlor	2	1	50.0%									
48	Aldicarb	2	1	50.0%									
49	Atrazin	2	1	50.0%									

PICs found in all products sampled by EU MS in 2022

N.	PIC Pesticide	Samples with PIC	Samples with PIC residues >MRL	%Samples with PIC >MRL	WHO 1a	WHO 1b	POP	Carc. 1B	Carc. 2	Muta. 1B	Muta. 2	Repr. 1B	Repr. 2
50	Azinphos-Ethyl	2	1	50.0%									
51	Endosulfan	2	0	0.0%									
52	Fenitrothion	2	0	0.0%									
53	Heptachlor	2	2	100.0%									
54	Maleic hydrazide	2	1	50.0%									
55	Nicotine	2	1	50.0%									
56	Phorate	2	0	0.0%									
57	Quinoxyfen	2	0	0.0%									
58	Acetochlor	1	0	0.0%									
59	Dichlorvos	1	1	100.0%									
60	Diquat (dibromide)	1	0	0.0%									
61	Mercury Compounds	1	0	0.0%									
62	Methidathion	1	1	100.0%									
63	Monocrotophos	1	1	100.0%									
64	Parathion	1	1	100.0%									
65	Parathion-Methyl	1	1	100.0%									
66	Phosalone	1	0	0.0%									
67	Picoxystrobin	1	1	100.0%									
68	Propachlor	1	0	0.0%									
69	Triazophos	1	1	100.0%									

Table 8. *PIC pesticides found in the analysed samples.*

Annex II PICs allowed an import tolerance

Explain LOD – CXL – import tolerance

Pesticide	Properties of concern	MRLs	Legislation
1,3-dichloropropene	Skin sensitising	LOD - https://www.efsa.europa.eu/en/efsajournal/pub/3221	Reg. (EU) 2015/552
Aldrin	Suspected to be Carcinogenic - POP Environmental	LOD apart for animal commodities, parsnip, cucurbits, spices and oilseeds.	Reg. (EC) No 839/2008
Alpha-cypermethrin	Under assessment as EDC Acute tox – Environmental toxicity	Import tolerance for many crops	Reg. (EU) 2017/626
Azinphos-methyl	Fatal if inhaled - acute tox Environement Skin sensitising	Deleted - LOD except for spices 0.5	Reg. (EU) 2020/1633
Azocyclotin	Fatal if inhaled - acute tox Environement Skin sensitising	Deleted - LOD except for wine grapes 0.3	Reg. (EU) No 899/2012
Benalaxyl including other mixtures of constituent isomers including benalaxyl-M (sum of isomers)	Very toxic to aquatic life with long lasting effects Harmful if swallowed	LOD - > LOD for grapes - solanaceae - melons - lettuces	Reg. (EU) 2023/128
Beta-cyfluthrin	No notified hazards by manufacturers, importers or downstream users for this substance.	LOD - > LOD Solanaceae - citrus - sesameseeds = rapeseeds - soybeans - weath - spices - animal products	
Beta-cypermethrin	Toxic if swallowed - harmful if inhaled Serious eye irritation, skin irritation Very toxic to aquatic life, causes.	Import tolerance for many crops	Reg. (EU) 2017/626
Bifenthrin	Suspected to be Carcinogenic - CARC 2 Fatal if swallowed - toxic if inhaled Serious eye irritation, skin irritation Very toxic to aquatic life - long lasting effects	CXL - many above LOD	Reg. (EU) 2018/687
Binapacryl	Toxic to reproduction - REPR 1B Very toxic to aquatic life with long lasting effects harmful if swallowed - harmful in contact with skin	Under dinoseb - LOD	Reg. (EU) 2015/868

Pesticide	Properties of concern	MRLs	Legislation
Carbaryl	Suspected to be Carcinogenic - CARC 2 Harmful if swallowed - harmful if inhaled Very toxic to aquatic life	LOD - for cereals is low but not LOD - no explanation in the Regulation	Reg. (EU) No 1096/2014
Carbendazim - Carbendazim and benomyl (sum of benomyl and carbendazim expressed as carbendazim)®	Mutagenic - MUTA 1B Toxic to reproduction - REPR 1B Very toxic to aquatic life - long lasting effects	LOD - >LOD for citrus,pome, stone fruits - grapes - solanaceae	Reg. (EU) No 559/2011
Chlorpropham	Suspected to be Carcinogenic - CARC 2 Very toxic to aquatic life - long lasting effects	Deleted - LOD except for potatoes	Reg. (EU) 2023/377
Clothianidin	Suspected to be toxic to reproduction - REPR 2 Very toxic to aquatic life with long lasting effects Harmful if swallowed	LOD - >LOD for citrus - cherries - grapes - avocados - banans - mangoes - solanaceae - herbs and edible flowers - beans - brassica - tess - coffee beans - animal liver and edible offals	Reg. (EU) 2023/334 Reg. (EU) 2017/671
Cyfluthrin	Fatal if inhaled - fatal if swallowed Very toxic to aquatic life - lomng lasting effects	LOD for some products - not for all	Reg. (EU) 2023/173
Cyhalothrine - [could only find this on the EU database: Lambda-cyhalothrin (includes gamma-cyhalothrin) (sum of R,S and S,R isomers) (F)]	Fatal if inhaled - toxic if swallowed Very toxic to aquatic life - long lasting effects Serious eye irritation, skin irritation	Authorization requested for seed and fruit spices *(2021) earlier for celeries, Florence fennels, soyabeans, sunflower seeds and rice (2019)	Reg. (EU) 2021/590
Cyhexatin	Harmful if swallowed -harmful if inhaled Very toxic to aquatic life - long lasting effects Harmful in contact with skin	Deleted - LOD except for oranges, apples and wine grapes for which CXL is in place	Reg. (EU) No 899/2012
Cyproconazole	Toxic to reproduction - REPR 1B Toxic if swallowed Very toxic to aquatic life with long lasting effects	LOD - >LOD pome,stone fruits,grapes, lettuce, asparagus, celeri, artichoke, pulsed, some oilseeds, cereals,coffee beans, liver-kidney-edible offalls	Reg. (EU) 2018/707
DDT	Suspected to be Carcinogenic - CARC 2 Toxic if swallowed - chronic toxicity Very toxic to aquatic life - long lasting effects	LOD- > LOD coffee bean, herbal infusion, seed and fruit spices, all animal products	Reg. (EU) 2023/163

Pesticide	Properties of concern	MRLs	Legislation
Diazinon	Presumed human carcinogen - CARC 1B Suspected to be mutagenic - MUTA 2 Harmful if swallowed Very toxic to aquatic life - long lasting effects	LOD - > LOD pineapples - chinese cabbage - kohlrabies - seed spices - root and rizhome spices - ugarbeet - milk - muscle - fat - liver - kidney.	Reg. (EU) No 834/2013
Dicloran	Fatal if inhaled - fatal if swallowed Fatal in contact with skin - chronic toxicity Toxic to aquatic life - long lasting effects	LOD - >LODf or onions - for pulses and cereals it raises from 0.01 to 0.02, for TEAS, COFFEE, HERBAL INFUSIONS, COCOA AND CAROBS. For spices LOD raises from 0.01 to 0.05. For liver from 0.01 to 0.02.	Reg. (EU) No 1126/2014
Didecyldimethylammonium chloride	Toxic if swallowed Very toxic to aquatic life - long lasting effects Serious eye irritation	Not LOD - note "These MRLs shall be reviewed by 22/02/2030" Reassessment of data may lead to modification of MRLs. Residues now under temporary MRLs	Reg. (EU) 2023/377
Dieldrin	Suspected to be Carcinogenic - CARC 2 - POP Fatal in contact with skin - toxic if swallowed - Chronic toxicity Very toxic to aquatic life with long lasting effects	LOD - meat and milk CXL - not clear why oilseeds and spices have not the MRL set as LOD	Reg. (EC) No 839/2008
Diquat, including diquat dibromide	Fatal if inhaled - harmful if swallowed Very toxic to aquatic life - long lasting effects Serious eye irritation, skin and respiratory irritation	LOD for most products - CXL for citrus-pome and stone fruits, banana some nuts - for eggs higher than CXL	Reg. (EU) 2016/1002
Endosulfan	Fatal if inhaled - fatal if swallowed Toxic to aquatic life - long lasting effects	LOD for most products - CXL for spices and cotton seeds	Reg. (EU) No 310/2011
Ethion	Toxic if swallowed Very toxic to aquatic life - long lasting effects Harmful in contact with skin	LOD - increaed accordin t the Reg - CXL for spices	Reg. (EU) No 310/2011
Famoxadone	Chronic toxicity Very toxic to aquatic life with long lasting effects	LOD - CXL for wine grapes, potatoes, tomatoes, cucumbers, courgettes, barley, wheat, meat, milks	Reg. (EU) 2024/352
Fenarimol	Suspected to be toxic to reproduction - REPR 2 Very toxic to aquatic life with long lasting effects May cause harm to breast-fed childr	LOD - >LOD for the use of fenarimol on peaches, grapes, strawberries, bananas, tomatoes and watermelons the submitted data are not sufficient to set new MRLs.	Reg. (EU) No 318/2014
Fenbuconazole	Very toxic to aquatic life Very toxic to aquatic life with long lasting effects	LOD - >LOD for citrus, pome, stone fruits - some berries - grapes - bananas - peppers - barley - rye - liver - kidney - edible offalls	Reg.(EU) 2019/1559

Pesticide	Properties of concern	MRLs	Legislation
Fenitrothion	Harmful if swallowed Very toxic to aquatic life - long lasting effects Skin sensitising	LOD - CXL for spices	Reg. (EU) No 834/2013
Fenpropathrin	Fatal if inhaled - toxic if swallowed Very toxic to aquatic life - long lasting effects Harmful in contact with skin	LOD except for Teas and citrus fruits (CXL) and mel-ons - lower than CXL but not justified in the Reg	Reg. (EU) No 1126/2014
Fenthion	Suspected to be mutagenic - MUTA 2 Harmful if swallowed - chronic toxicity Very toxic to aquatic life - long lasting effects Harmful in contact with skin	Deleted - LOD see comment	Reg. (EU) 2023/377
Fenvalerate	Toxic if swallowed - harmful if inhaled Very toxic to aquatic life - long lasting effects Skin irritation - respiratory irritation	LOD for the main products but for many others EFSA identified some information on residue trials as unavailable.	Reg. (EC) No 839/2008
Fipronil	Toxic if swallowed - toxic in contact with skin Toxic if inhaled- chronic toxicity Very toxic to aquatic life with long lasting effects	LOD - > LOD in sugar canes, bovine fat, sheep fat and goat fat - import tolerance?	Reg. (EU) 2016/1002
Flufenoxuron	Very toxic to aquatic life with long lasting effects May cause harm to breast-fed children	Deleted - LOD except for tea	Reg. (EU) No 310/2011
Furathiocarb	Fatal if inhaled - toxic if swallowed Very toxic to aquatic life with long lasting effects Serious eye irritation - chronic toxicity - Skin irritation and may cause allergic skin reaction	As carbofuran	Reg. (EU) No 310/2011
Glufosinate, including glufosi-nate-ammonium	NO INFO ON ECHA	Some MRLs very low butnot marked as LOD	Reg. (EU) 2024/352
Heptachlor	Suspected to be Carcinogenic - CARC 2 Toxic in contact with skin - toxic if swallowed Chronic toxicity Very toxic to aquatic life with long lasting effects	LOD for mains products - low MRLs but not indi-cated as MRLs for others - lower than CXLexcept from meat	Reg. (EU) No 318/2014
Hexachlorobenzene	Presumed human carcinogen - CARC 1B - POP Chronic toxicity Very toxic to aquatic life with long lasting effects	Deleted - LOD - except from pumpkin seeds	Reg.(EU) 2019/1559
Imidacloprid	Toxic if swallowed Very toxic to aquatic life with long lasting effects	Some MRLs are LOD - other requires revi-sion - some lower and some higher that CXL - some CXL	Reg. (EU) 2021/1881

Pesticide	Properties of concern	MRLs	Legislation
Isopyrazam	Suspected to be Carcinogenic - CARC 2 Toxic to reproduction - REPR 1B Very toxic to aquatic life with long lasting effects	Some of the limits are higher than CXL - check import tolerance	Reg. (EU) 2019/552
Lufenuron	Very toxic to aquatic life with long lasting effects May cause allergic skin reaction	Some of the limits are higher than CXL - check import tolerance	Reg. (EU) 2020/856
Malathion	Harmful if swallowed Very toxic to aquatic life with long lasting effects May cause allergic skin reaction	Some of the limits are lower than CXL - check import tolerance	Regulation (EU) 2015/399
Maleic hydrazide salts other than choline, potassium and sodium salts	NO INFO ON ECHA	Really high MRLs for some products (pota-toes-carrots-bulbs veg-chicory-meat-eggs	Reg. (EU) 2021/590
Mancozeb	Suspected to be Carcinogenic - CARC 2 Toxic to reproduction - REPR 1B Very toxic to aquatic life with long lasting effects Chronic toxicity - may cause allergic skin reaction	Some MRLs lower some higher than CXL - check import tolerance	Reg. (EU) 2017/171
Maneb	Suspected to be toxic to reproduction - REPR 2 Very toxic to aquatic life with long lasting effects Harmful if inhaled- may cause allergic skin reaction Serious eye irritation	Some MRLs lower some higher than CXL - check import tolerance	Reg. (EU) 2017/171
Mercury compounds	NO INFO ON ECHA	Some residues over LOD - environmental con-tamination - dietary exposure is considered low - and there is no health risk for consumers - Reconsidered in 2028	Reg. (EU) 2018/73
Metam-sodium	Harmful if swallowed Severe skin burns and eye damage May cause an allergic skin reaction Very toxic to aquatic life with long lasting effects	Not banned - mentioned only as precursor of methylisothiocyanate	Reg. (EU) 2022/78
Methidathion	Fatal if swallowed - harmful in contact with skin Very toxic to aquatic life with long lasting effects	Mainly LOD - lower than before for pome fruit but no LOD - LOD raised for some crops	Reg. (EU) No 310/2011
Methomyl	Fatal if inhaled - fatal if swallowed Toxic to aquatic life - long lasting effect	Deleted - LOD except for kumquats and gher-kins = CXL	Reg. (EU) 2023/1783
Methyl-parathion	Fatal if swallowed - fatal if inhaled Toxic in contact with skin - chronic toxicity Very toxic to aquatic life with long lasting effects	LOD except for spices and roots	Reg. (EU) No 899/2012

Pesticide	Properties of concern	MRLs	Legislation
Myclobutanil	Suspected to be toxic to reproduction - REPR 2 Harmful if swallowed - serious eye irritation Toxic to aquatic life with long lasting effects Chronic toxicity	MRLs higher than LOD - grapes and hops higher than CXL	Reg. (EU) 2020/770
Nicotine	Fatal if swallowed, fatal if inhaled - eye damage Fatal in contact with skin - skin irritation Toxic to aquatic life with long lasting effects	Almost all LOD - for some products scientific evidence is not conclusive to demonstrate that nicotine occurs naturally in the concerned crop and to elucidate its mechanism of formation	Reg. (EU) 2024/451
Paraquat	Fatal if inhaled - toxic if swallowed - chronic toxicity Toxic in contact with skin - serious eye irritation very toxic to aquatic life with long lasting effects Skin irritation - may cause respiratory irritation	LOD except for rice = CXL	Reg. (EU) No 520/2011
Parathion	Fatal if swallowed - fatal if inhaled Toxic in contact with skin - chronic toxicity Very toxic to aquatic life with long lasting effects	LOD except for spices roots and rhizomes	Reg. (EC) No 839/2008
Phorate	Fatal if swallowed - fatal in contact with skin Very toxic to aquatic life with long lasting effects	LOD except for maize - meat-seed spices = CXL	Reg. (EU) No 899/2012
Phosalone	Toxic if swallowed - harmful if inhaled Harmful in contact with skin May cause an allergic skin reaction Very toxic to aquatic life with long lasting effects	LOD except for spices = CXL	Reg. (EU) 2020/1633
Propargite	Suspected to be Carcinogenic - CARC 2 Under assessment as EDC Toxic if inhaled - serious eye damage - skin irritation Very toxic to aquatic life with long lasting effects	LOD - import tolerance for oranges (Brazil) and tea (India)	Reg. (EU) 2018/832
Quinoxyfen	Very toxic to aquatic life with long lasting effects May cause an allergic skin reaction Persistent, Bioaccumulative and Toxic	Application mentioned only for hops agreed by EFSA) but barley, milk, berries, strawberries, oat and grapes have MRLs > LOD	Reg. (EU) No 36/2014
Simazine	Suspected to be Carcinogenic - CARC 2 Very toxic to aquatic life with long lasting effects	LOD except for cherries, grapes, cranberries. No mention of import tolerance in the regulation - no CXL	Reg. (EU) No 310/2011

Table 9. *60 PIC pesticides allowed an import tolerance.*
In light orange 24 PIC pesticides found on analysed samples exceeding MRLs. In light blue 12 PIC pesticides found NOT exceeding MRLs.

Annex III PAN International Indicators for Identifying 'Highly Hazardous Pesticides'

High acute toxicity
'Extremely hazardous' (Class Ia) according to WHO Recommended Classification of Pesticides by Hazard or
'Highly hazardous' (Class Ib) according to WHO Recommended Classification of Pesticides by Hazard or
'Fatal if inhaled' (H330) according to the EU or the Japan Globally Harmonized System (GHS) or
Long term toxic effects
Carcinogenic to humans according to IARC or US EPA or
'Known or presumed human carcinogens' (Category I) according to the EU or the Japan Globally Harmonized System (GHS) or
Probable/likely carcinogenic to humans according to IARC, US EPA or
Likely to be Carcinogenic to Humans: At High Doses according to EPA or
'Substances known to induce heritable mutations or to be regarded as if they induce heritable mutations in the germ cells of humans', 'Substances known to induce heritable mutations in the germ cells of humans' (Category I) according to the EU or the Japan Globally Harmonized System (GHS) or
'Known or Presumed human reproductive toxicant' (Category I) according to the EU or the Japan Globally Harmonized System (GHS) or
Endocrine disruptor
EU interim criteria as laid down in Reg. (EC) No 1107/2009 'Suspected human reproductive toxicant' (Category 2) AND 'Suspected human carcinogen' (Category 2) according to the EU or the Japan Globally Harmonized System (GHS) or
Pesticides identified as endocrine disrupters in the EU according to Reg. (EU) 2018/605
High environmental concern
Pesticides listed in Annex A & B of the Stockholm Convention or meeting the Conventions' criteria or Ozone depleting pesticides according to the Montreal Protocol or
High environmental concern – where two of the three following criteria are met:
P = 'Very persistent' half-life > 60 days in marine- or freshwater or half-life > 180 days in soil ('typical' half-life), marine or freshwater sediment) (Indi-cators and thresholds according to the Stockholm Convention) AND/OR
B = 'Very bioaccumulative' (BCF >5000) or Kow logP > 5 (existing BCF data supersede Kow log P data) (Indicators and thresholds according to the Stock-holm Convention) AND/OR
T = Very toxic to aquatic organisms (LC/EC 50 [48h] for Daphnia spp. < 0,1 mg/l)
Hazard to ecosystem services
'Highly toxic for bees' according to U.S. EPA (LD50, µg/bee < 2) or
Known to cause a high incidence of severe or irreversible adverse effects
Pesticides listed in Annex III of the Rotterdam Convention or meeting the Conventions' criteria

Table 10. *Criteria and sources used by PAN to identify pesticides considered to be highly hazardous according to PAN.*

Double standard Double risk

Banned pesticides in Europe's food supply

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