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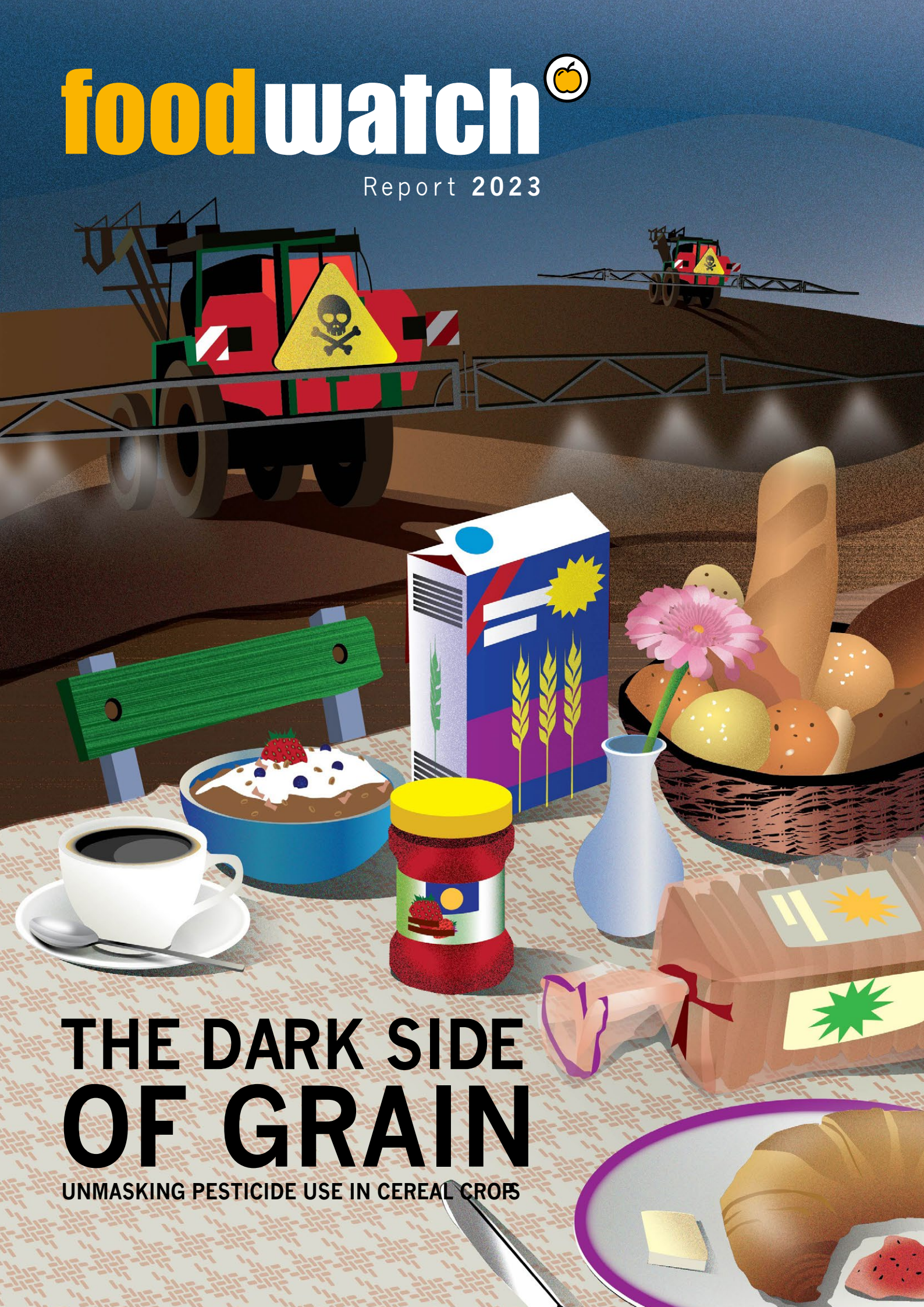
Report **2023**



THE DARK SIDE OF GRAIN

UNMASKING PESTICIDE USE IN CEREAL CROPS

IMPRINT

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THE DARK SIDE OF GRAIN

Unmasking pesticide use in cereal crops

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*“ **The current high input intensive agricultural model, based on chemical pesticides, is likely to pose a food security threat** in the medium term due to a loss of biodiversity, the likely increase in pests, decline in soil health, and loss of pollinators, which are essential to agricultural production.”*

European Commission Staff Working Paper, 2023

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INTRODUCTION

The widespread use of pesticides in agriculture is a cause for public concern due to its impact on human health and the environment. However, the true extent of this issue remains largely concealed from consumers.

This report specifically focuses on the extensive use of pesticides in cereal[1] production, an area that often receives less attention compared to the more frequently discussed problem of pesticide residues on fruits and vegetables.

The report presents a comprehensive analysis of pesticide utilisation in cereal production. It includes an examination of sample tests conducted on cereals, flour, and bread across the EU, revealing that 37% of all samples contain residues from 65 different pesticides.

In this report, foodwatch assesses claims made regarding environmentally friendly production and sustainability strategies by major retailers in Germany, France and the Netherlands. In general, retailers acknowledge their responsibility and have the necessary procedures and resources to address both pesticide use and residues in their products. However, their current efforts are limited to fruits and vegetables.

To address the widespread use of pesticides, the solution is clear: The extensive land areas dedicated to cereal cultivation must transition to pesticide-free production. Pesticide-free grain production is already underway and can be implemented on a large scale. Retailers throughout Europe bear a specific responsibility to promote this essential change.

A sustainable and pesticide-free food system is attainable. Widespread adoption of pesticide-free farming practices would help maintain soil integrity, protect groundwater and preserve air quality, benefiting both people and the environment. Let's start with our daily bread …

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[1] A **cereal** is any grass cultivated for its edible **grain** (botanically, a type of fruit called a caryopsis), which is composed of an endosperm, a germ, and a bran. **Cereal grain crops** are grown in greater quantities and provide more food energy worldwide than any other type of crop and are therefore staple crops. They include rice, wheat, rye, oats, barley, millet, and maize. https://databank.worldbank.org/metadataglossary/world-development-indicators/series/AG.PRD.CREL.MT

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KEY FINDINGS

1. LARGE-SCALE CEREAL CULTIVATION

- Approximately 50% of Europe's arable land, totalling 52 million hectares, is dedicated to cultivating cereals like wheat and maize. Each hectare of cereal crops undergoes 4-6 pesticide treatments during the growing season.
- This extensive land used for cereal production ranks amongst the largest pesticide consumers in Europe.
- Multiplying 52 million hectares by 4-6 pesticide treatments results in the application of excessive pesticide quantities annually, posing risks to human health and endangering insects and wild plants with the threat of extinction.
- Transitioning to pesticide-free cereal production across these 52 million hectares could potentially reverse the decline of biodiversity and reduce health risks for farm workers, rural residents and consumers.
- Wheat and barley alone account for 45% of pesticide use in Germany[2] and more than 60% of the cumulative treated area.
- In France, out of 66.5 million pesticide treatments, over 50% target cereals, including wheat, barley, and triticale.[3]

[2] Data is only available for winter wheat and winter barley. Data for other cereals like triticale, rye, summer barley, summer wheat and oats are not included.

[3] Triticale is a hybrid of wheat and rye first bred in laboratories during the late 19th century in Scotland and Germany.

2. PESTICIDE RESIDUES IN GRAIN PRODUCTS

- An analysis of the European Food Safety Authority's (EFSA) database[4] of public residue tests reveals that one-third of grain product samples contain one or more pesticides[5].
- The prevalence of pesticide residues varies significantly among different grain types, ranging from less than 10% in samples of emmer grain and rye to nearly 90% in wheat bread and rolls.
- Flour, rolled oats, and bread exhibit higher detection rates for pesticide residues compared to unprocessed grains.
- Out of 2,234 tested samples, 1,215 residues from 65 different pesticides were detected. Of these, 18 residues in 14 samples exceeded the Maximum Residue Limits (MRLs).

[4] https://zenodo.org/communities/efsa-kj search?page=1&size=20&q=%22results%20from%20the%20monitoring%20of%20pesticide%20residues%20in%20food%22

[5] Out of 2,234 samples of grain products, 837 contained one or more pesticides (37%).

3. RETAILERS' LACK OF PESTICIDE-FREE WHEAT PRODUCTION STRATEGY

An investigation into 20 retailers in Germany, France, the Netherlands[6] and one retailer in Switzerland reveals that retailers often promote labels and programs related to biodiversity, especially in Germany, to some extent in the Netherlands, and less in France.

- However, none of the analysed retailers has adopted a biodiversity strategy that encompasses cereal production. The only retailer with a pesticide-free grain program appears to be Migros in Switzerland.

4. PESTICIDE-FREE CEREAL PRODUCTION ALREADY IN PROGRESS

- Pesticide-free cereal production is not only possible but is also actively taking place in some European regions. Migros in Switzerland, for instance, champions pesticide-free production.

- Another notable example is the Maurer bakery located in Germany, which has established itself as a pioneer in promoting sustainable and pesticide-free agricultural practices.

[6] In France, foodwatch contacted Carrefour, Lidl, Leclerc, Système U, Mousquetaires and Casino. In Germany, foodwatch contacted Aldi Nord, Aldi Süd, Rewe, Edeka, tegut (LIDL did not reply to the questions). In the Netherlands, foodwatch reached out to ten supermarkets: Albert Heijn, Jumbo, Coop, Plus, Dirk, Lidl, Aldi, Vomar, DekaMarkt and Spar. The analysis also includes Migros from Switzerland.

foodwatch's demands to retailers

1. Commit to making the entire range of cereal and grain products pesticide-free[7] by 2025.

2. Implement a procurement policy prioritizing "pesticide-free" grain products.

3. Ensure transparency throughout the process by annually publishing data indicating which products are produced pesticide-free and which are not.

[7] Pesticide-free production methods distinguish themselves from organic production approaches by including fewer limitations at the field and farm levels. The utilisation of artificial fertilisers remains an option within these methods. Moreover, it is feasible to implement production systems that are partially pesticide-free, allowing for the voluntary transition of specific segments of crop rotations into pesticide-free practices.

PART I

PESTICIDE USE – IMPACT ON THE ENVIRONMENT AND HUMAN HEALTH

***"The current high input intensive agricultural model, based on chemical pesticides, is likely to pose a food security threat** in the medium term due to a loss of biodiversity, the likely increase in pests, decline in soil health, and loss of pollinators, which are essential to agricultural production."*

European Commission Staff Working Paper, 2023[8]

WHY THE URGENCY?

Scientists warn that the 6th mass extinction on our planet has begun. In the EU, one in six species of bees, butterflies and hoverflies is at risk of extinction. 80% of the crop and wild plant species depend on animal pollination. The loss of pollinators jeopardizes our ability to produce food. The European Commission reports that half of the EU's agricultural land already faces a pollination deficit.

Furthermore, there has been a decline of 600 million birds in Europe since 1980[9]. This decline impacts farming since birds naturally help control insects and pests.

States committed at the 2022 UN Biodiversity conference in Montreal to *"reduce the overall risk from pesticides and highly hazardous chemicals by at least half, including through integrated pest management, based on science, taking into account food security and livelihoods."*[10]

However, despite this agreement, the EU still lacks a plan to fulfil this commitment.

***"Pesticides can remain for years in the environment and accumulate in soils and water, but also in humans,** albeit that in Europe levels of pesticide residues in food products beyond the legal limits are rare."*

European Commission Staff Working Paper, 2023[11]

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[8] Commission staff working document, "Drivers of Food Security", published 04/01/2023, https://commission.europa.eu/system/files/2023-01/SWD_2023_4_1_EN_document_travail_service_part1_v2.pdf

[9] https://www.nhm.ac.uk/discover/news/2021/november/600-million-birds-lost-across-europe-since-1980.html

[10] https://www.cbd.int/article/cop15-cbd-press-release-final-19dec2022

[11] Commission staff working document, "Drivers of Food Security", published 04/01/2023, https://commission.europa.eu/publications/analysis-main-drivers-food-security_en

The Cocktail Effect

Pesticide products often contain multiple active ingredients; in practice, several products are frequently applied together. Over a crop season, numerous applications may occur, and depending on the crop and crop rotation, the same area may be treated with various pesticides. The presence of multiple chemicals, including heavy metals, radioactive materials, plasticizers, flame retardants, drugs, and antibiotics, in foods or leaking into the environment is commonly referred to as a "chemical cocktail".

The adverse effects of the simultaneous presence of chemical cocktails are not considered in the official pesticide risk assessment, which is based on the erroneous assumption that people and the environment are exposed to only one chemical at a time.

Recently published results from monitoring 106 chemicals in German children aged 3-13 years revealed that:

"A large portion of the participating children and adolescents are burdened with a variety of the examined pollutants. These substances almost universally possess toxicologically concerning properties; therefore, the simultaneous exposure to multiple pollutants is particularly critical due to possible mixture effects. The effects of substances with similar mechanisms of action can add up, so that a critical level of exposure can be reached in total, even if the exposure to the individual substances is considered to be non-critical."[12]

Given the substantial chemical cocktail in our daily lives, it is imperative to prioritise reducing chemical usage wherever possible. Pesticide use can be avoided, and this should be a top priority.

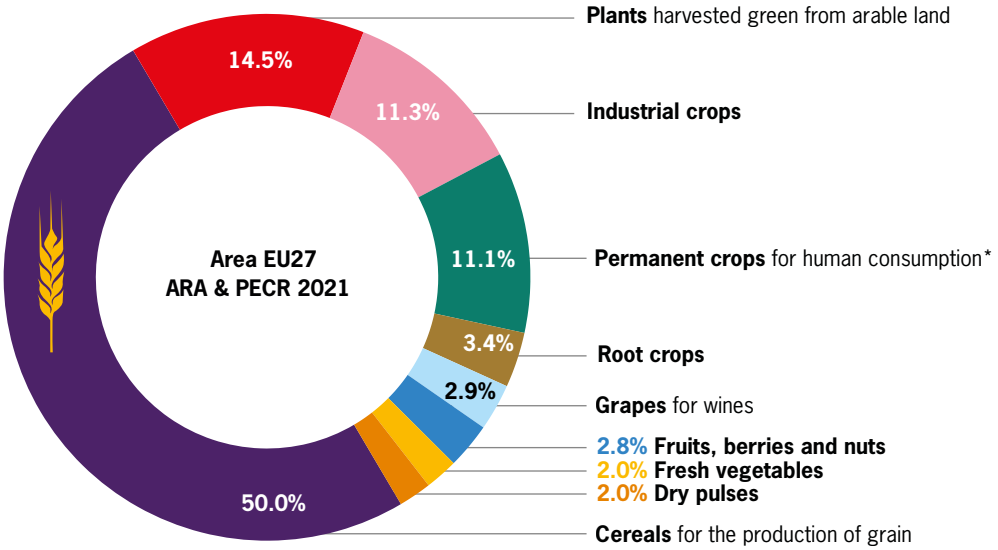
[12] UBA (2023): Deutsche Umweltstudie zur Gesundheit von Kindern und Jugendlichen 2014–2017 (GerES V Teil 1: Human-Biomonitoring). UMWELT UND GESUNDHEIT 02/2023. https://www.umweltbundesamt.de/sites/default/files/medien/479/publikationen/uug_02-2023_deutsche_umweltstudie_zur_gesundheit_von_kindern_und_jugendlichen_2014-2017.pdf

PART II

CEREAL PRODUCTION IN THE EU – THE LARGEST LAND USE

Compared to large countries like the United States, China, or Ukraine, the EU dedicates a relatively small proportion of its land to agriculture. Approximately 25% of its total land area, or 98.1 million hectares, is designated as arable land. **Half of this arable land is utilised for cultivating cereals, covering an area nearly as extensive as the country of France.** In contrast, the land in the EU allocated to vegetable farming is equivalent in size to Slovenia, the third smallest EU Member State (see the graph below based on EUROSTAT data).

Figure 1
Distribution of Crop Area in the EU (2020)

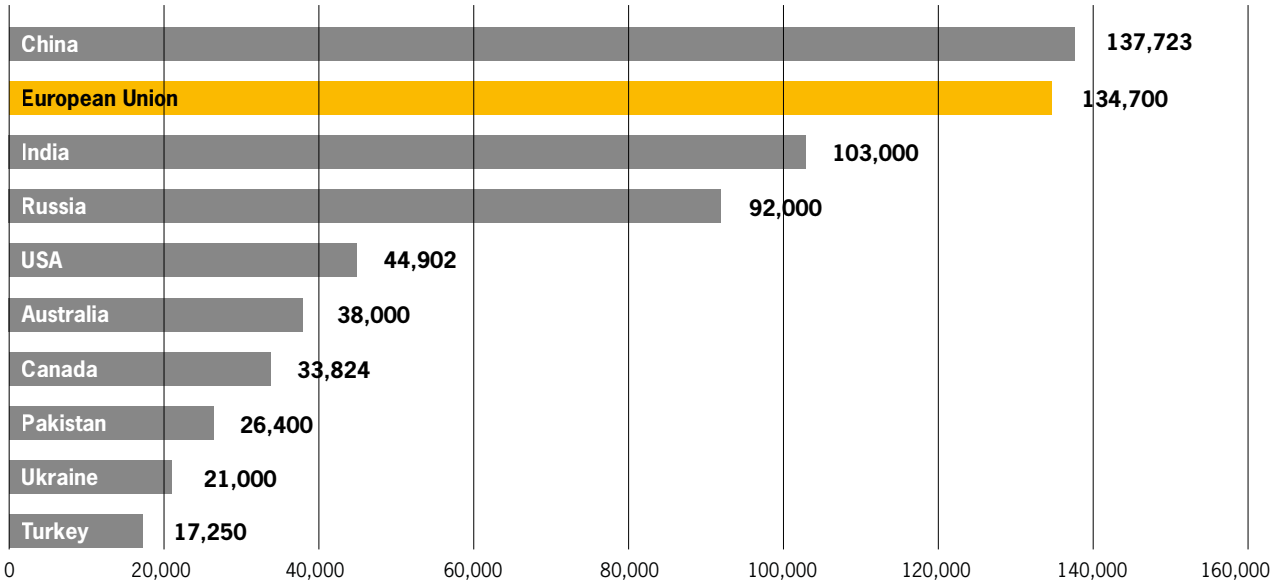


Nevertheless, the EU is one of the world's largest producers of cereal grain crops. In 2020, it emerged as the top global producer of wheat. Cereals, cereal preparations, and milled products exhibited a substantial surge in 2022, with an export value increase of 41% year-to-year. In 2022, the EU exported EUR 16.9 billion in cereals and EUR 23 billion in cereal preparations and milled products. These products accounted for 7% and 10% of EU exports, respectively.[13] The EU maintains a wheat and barley production surplus but imports maize and rice.[14]

[13] https://agriculture.ec.europa.eu/system/files/2023-04/monitoring-agri-food-trade_dec2022_en.pdf

[14] https://agriculture.ec.europa.eu/system/files/2023-01/agricultural-outlook-executive-summary_en.pdf

Figure 2
Leading 10 Wheat Producers Worldwide in 2022/2023



Production in thousand metric tons

Nearly two-thirds of the EU's cereals, including maize, are allocated for animal feed, one-third for human consumption, and 3% for biofuels.[15]

In the case of wheat, nearly 30% is utilised for human consumption, while 28% serves as animal feed (see figure 3).

Figure 3
EU Wheat use

Source: International Grain Council Supply and Demand Forecast 22/23
Production in thousand metric tons

[15] https://agriculture.ec.europa.eu/farming/crop-productions-and-plant-based-products/cereals_en

EU LACKS HARMONISED PESTICIDE DATA

A substantial number of products available in supermarkets across the EU rely on cereal grains grown within its borders. These grains are used in food production and fed to livestock, contributing to the production of meat and dairy products.

Despite the free movement of food and feed products within the EU's internal market, efforts to harmonise data collection regarding pesticide use in various EU countries have proven unsuccessful. Each country prefers to maintain its unique methodology.

In **Germany**, pesticide-use data are annually published for nine main crops, detailing the pesticides used in these crops. Authorities calculate both the pesticide-exposed area and the quantities used. Wheat and barley alone account for 45% of pesticide use in Germany[16] (German Toxic Load) and over 60% of the cumulative treated area.

In **Denmark**, authorities calculate the "Pesticide Load' annually, representing pesticide use. Results indicate that cereals constitute approximately 67% of Denmark's pesticide use.[17]

France boasts extensive arable crop areas typical of Northern Europe and significant regions featuring crops associated with more southern climates, such as olives, vineyards, stone fruit, and citrus fruit. French authorities regularly determine the "Treatment Frequency Index' for about 27 crops concerning pesticides.[18] A reasonable estimate of the total number of treatments within these 27 crops is obtained by multiplying this index with the planted hectare of each crop. This calculation results in roughly 66.5 million treatments, with over 50% targeting cereals like wheat, barley, and triticale.

The Netherlands, on the other hand, specialises in high-intensity crops such as flowers and potatoes. Winter wheat and spring barley account for less than 7%[19] of pesticide consumption. However, like others across the EU, Dutch consumers are influenced by pesticide use in other EU Member States.

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[16] Data is only available for winter wheat and winter barley. Data for other cereals like triticale, rye, summer barley, summer wheat and oats are not included.

[17] Miljøstyrelsen (2023): Bekæmpelsesmiddel-statistik 2021. Behandlingshyppighed og pesticidbelastning baseret på salg og forbrug. Orientering. Orientering fra Miljøstyrelsen nr. 63 https://www2.mst.dk/Udgiv/publikationer/2023/05/978-87-7038-520-6.pdf

[18] TFI: Agreste 2020: Pratiques phytosanitaires en production légumière en 2018. Agreste 2021: Enquête Pratiques phytosanitaires en arboriculture en 2018; Agreste 2020: Enquête pratiques culturales en grandes cultures et prairies 2017; Agreste 2021: Pratiques culturales en viticulture en 2019; Crop area: agreste (above) and Eurostat tables

[19] https://opendata.cbs.nl/#/CBS/nl/dataset/85130NED/table?dl=96BF3

In summary, **the EU's data on annual pesticide use in specific crops remains scarce, non-harmonised, and incomplete.** Each Member State maintains its individual reporting approach, with variations in the frequency and intensity of crop surveys, indicators and reporting parameters.

This persists despite the EU's requirement for Member States to conduct crop surveys **every five years** for representative crops cultivated in the respective Member State.[20] Although Member States report the actual use per pesticide active ingredient[21] in each surveyed crop, Eurostat only publishes the total amounts of pesticide use per use type classification[22], crop, and country.[23] Nevertheless, for an effective assessment of pesticides, it is essential to identify and report the active ingredients and their toxic effects.

Thus far, data from three full survey years are available; however, these raw data have limited utility for several reasons:

1. A five-year gap between surveys is too lengthy, with weather extremes significantly influencing certain pesticide use, particularly related to precipitation levels. Differences between survey years with varying weather conditions can create misleading trends.

2. Larger agricultural areas in some countries naturally result in more substantial reported pesticide use, requiring data normalisation by crop acreage for meaningful comparisons.

3. Since 2010, when the first surveys commenced, over one hundred active pesticide ingredients have lost authorisation in the European Union, including many applied in high doses. This factor affects the reported amounts between survey years.

Clear annual reporting on pesticide use in the EU remains lacking. However, such reporting is crucial to pave the way for data-driven strategies, informed choices, and evidence-based policies.

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[20] According to Regulation (EC) No 1185/2009, the Member States shall collect the data necessary for the specification of the **quantity of each active substance** contained in plant protection products used on a selected crop and the **area treated with each substance**.

[21] https://ec.europa.eu/eurostat/cache/metadata/en/aei_pestuse_esms.htm#conf1678714236551

[22] See Regulation 2017/269 Annex III

[23] https://ec.europa.eu/eurostat/databrowser/view/aei_pestuse/default/table?lang=en


PART III

PESTICIDE USE IN CEREALS – A CLOSER LOOK

PRODUCTION

Figure 4 illustrates pesticide use in wheat and spelt per hectare of land across EU Member States. To conduct this assessment[24], we correlated data from the Eurostat database "Pesticide Use in Agriculture" with the Eurostat database "Crop Production in EU Standard Humidity,"[25] which provides information on crop acreage in each Member State for each year.

The graph specifically highlights the primary types of pesticide use: Fungicides (F), Herbicides (H), and Insecticides (I). Unfortunately, consistent reporting for Plant Growth Regulators (PGR) and other uses (ZR) is lacking across Member States.

Pesticides used in wheat and spelt cultivation are predominantly synthetic.[26]

Significant variations exist among Member States. Ireland employs the highest quantity of synthetic pesticides per hectare, followed by Germany, France, the Netherlands and Luxembourg, which has only a very small crop area.

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[24] Databases were downloaded and joined (Year, Country, Crop Code) in a relational database.

[25] https://ec.europa.eu/eurostat/databrowser/view/APRO_CPSH1/default/table?lang=en

[26] Organic pesticides are generally considered to be pesticides derived from naturally occurring sources such as minerals, plants, or animals. These chemicals are broken down relatively quickly by weather or soil microbes. Synthetic pesticides are man-made chemicals formulated or manufactured by a chemical process.

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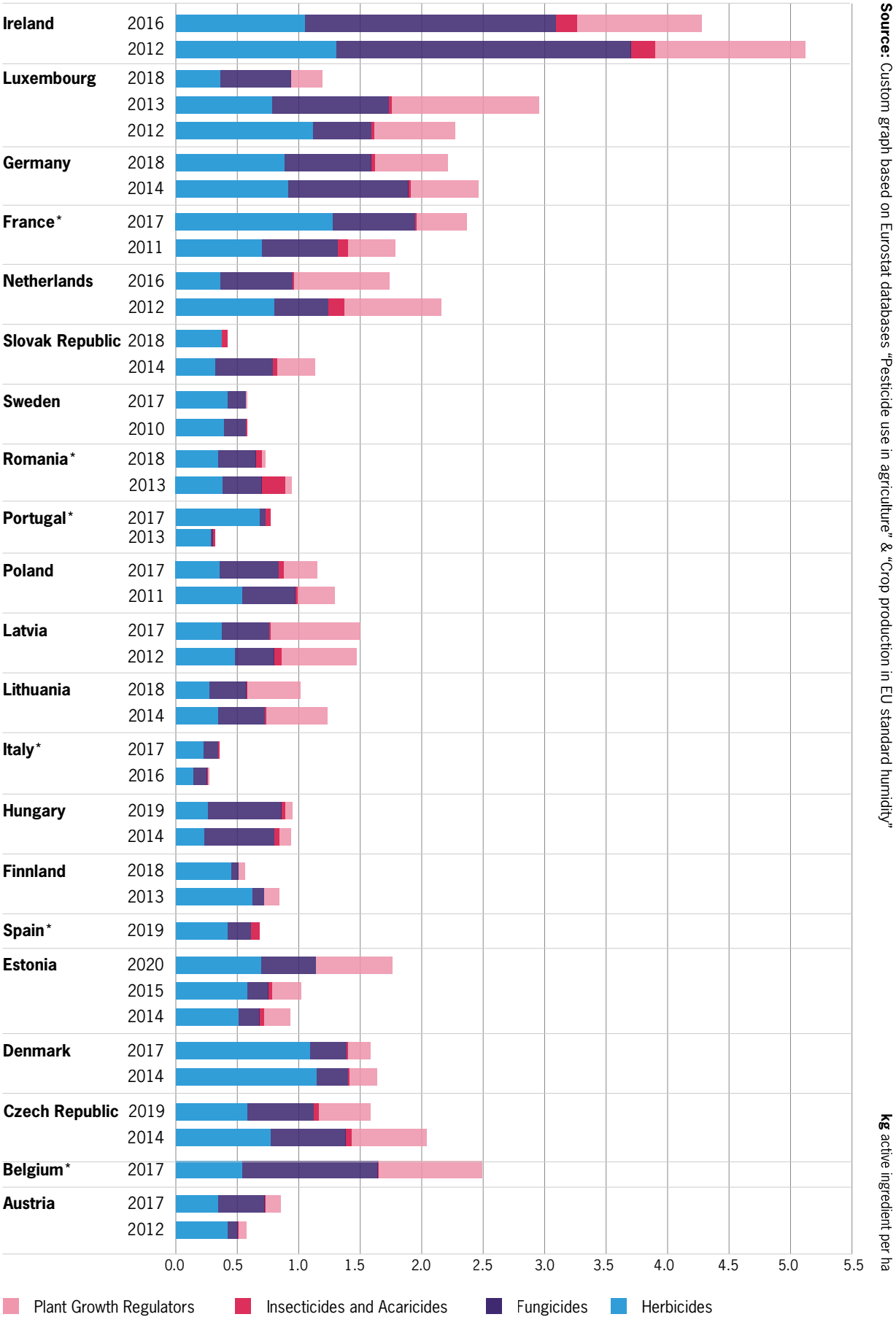
Figure 4

Pesticide Use in Wheat Production per European Member State (in kg of active ingredient/hectare)



Source: Custom graph based on Eurostat databases "Pesticide use in agriculture" & "Crop production in EU standard humidity"

Pesticide use in Common winter wheat and spelt (C1111) except ES, FR, PT*: Common wheat and spelt (C1110), BE, RO*: Wheat and spelt (C1100), IT*: Durum wheat (C1120)

HIGHLY HAZARDOUS PESTICIDES USED REGULARLY

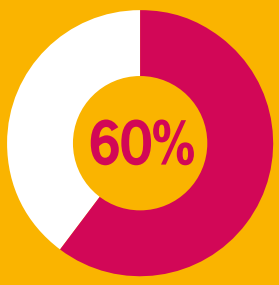
Since 2011, German authorities have surveyed nine major crops annually and published results detailing each crop's pesticide usage. These surveys include a ranking of the most commonly used pesticides by crop:[27]

- The latest data from 2021 for winter wheat indicates that the herbicides diflufenican, florasulam, and flufenacet are used by over 60% of wheat-growing farms.
- **Prothioconazole and tebuconazole, two fungicides, are used by over 80% and over 60% of farms, respectively.**
- The highly hazardous insecticide lambda-cyhalothrin was employed by 25% of farms.

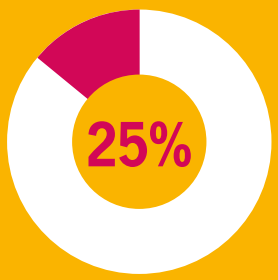
Diflufenican, flufenacet, lambda-cyhalothrin, and tebuconazole are considered "Candidates for Substitution"[28] due to their critical properties.

Diflufenican and flufenacet are common contaminants of surface waters. Flufenacet, upon soil degradation, transforms into trifluoroacetate (TFA)[29], which leaches into groundwater in substantial quantities and remains persistent and highly mobile, classifying it as a "forever chemical".[30]

The Treatment Frequency Index (TFI), a more reliable indicator for measuring pesticide use intensity, has remained relatively stable. However, the introduction of obligatory "Integrated Pest Management" in 2014, stipulating that pesticides should be used only as a last resort,[31] has not impacted pesticide use intensity in wheat.



Over 60% of wheat growing farms use critical, water polluting herbicides.



The highly hazardous insecticides lambda-cyhalothrin was used by 25% of the farms.

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[27] Only available in German: https://papa.julius-kuehn.de/index.php?menuid=34

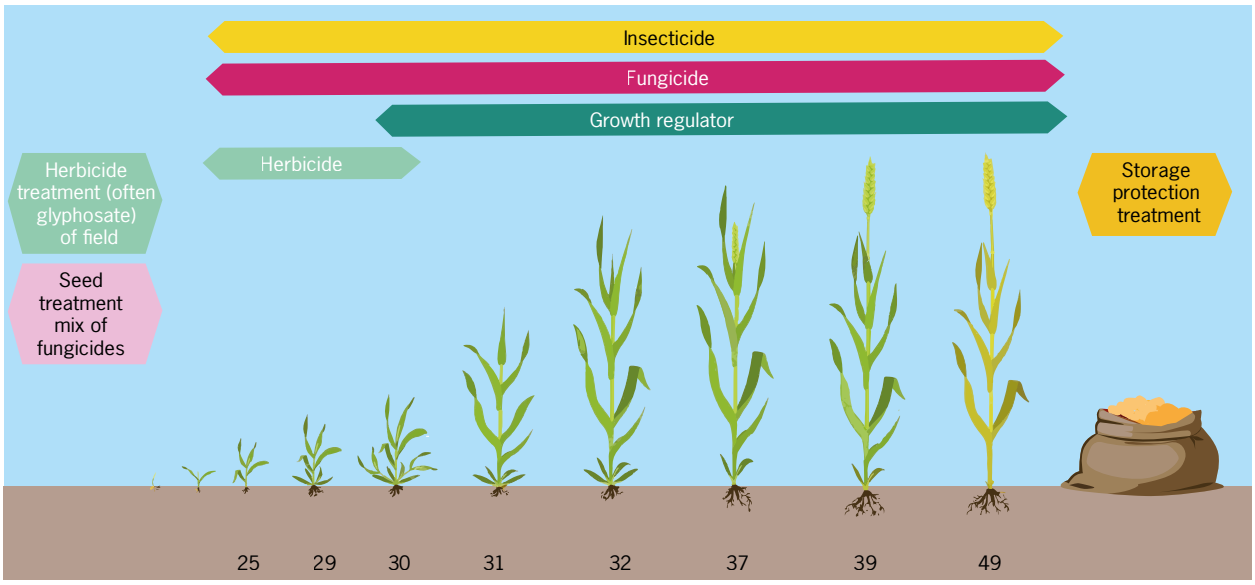
[28] Is defined in Regulation (EC) No 1107/2009 and include active substance that have critical effects such as developmental neurotoxic or immunotoxic effects, or are classified as carcinogen or toxic for reproduction. https://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2009:309:0001:0050:en:PDF

[29] https://www.umweltbundesamt.de/en/topics/pesticide-authorisations-put-our-ground

[30] 'Forever chemicals' is the popular name given to a group of thousands of very stable chemicals that are extremely stable and remain in the environment for a very long time, contaminating air, water and soil.

[31] "Chemical pesticides should be used only as a last resort. This is the key principle of Integrated Pest Management" https://food.ec.europa.eu/plants/pesticides/sustainable-use-pesticides_en

Figure 5
Example of Treatment Frequency of Cereal Production



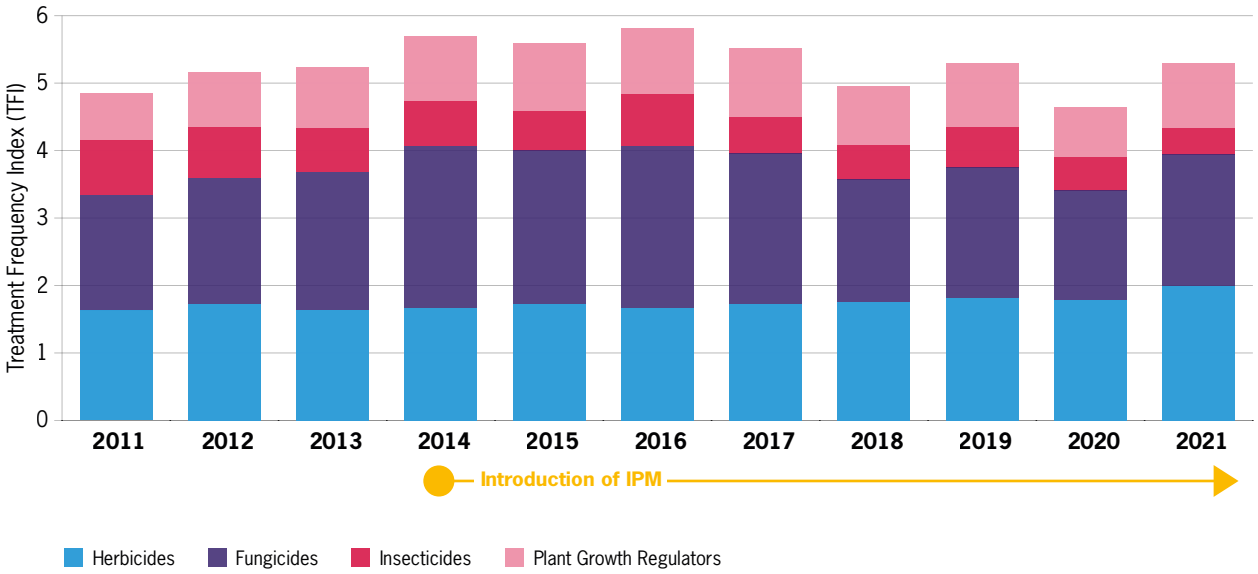
" You need to work with nature and not against it. Reduction of pesticides is possible by freeing oneself from the "advice" given by "vendors of phytopharmaceuticals" and other farmers fearing even the smallest yield losses. To encourage this transition, we need more proactive support from public authorities."[32]

Sebastian Galland, farmer from France

[32] Quote from the Good food good farming project "Growing a better future: for People and Nature" that gives more visibility to farmers and field workers who are demanding a change in agriculture policies. https://www.goodfoodgoodfarming.eu/farmers-voices/

Figure 6

Winter Wheat Treatment Frequency with Pesticides 2011-2021 (Germany, Winter Wheat)



Source: Custom graph based on the Germany farm survey by the Julius Kühn Institute (JK)

The European Commission considers Integrated Pest Management (IPM) as one of the main tools to significantly reduce pesticide usage. It adheres to the principle that **"chemical pesticides should be used only as a last resort."** IPM became mandatory across the European Union in 2014.[33]

However, analysing the Treatment Frequency Index (TFI) of winter wheat in Germany over the past decade, focusing on 2014 and beyond after the introduction of IPM, it's evident that IPM has had no impact on reducing pesticide usage (**Figure 6**).

Merely publishing obligatory IPM guidelines and hoping for reduced pesticide use has proven ineffective in the past. **What is needed are legal and political instruments to enforce the principle of integrated pest management, emphasizing that pesticide treatment is permissible only as a last resort.**

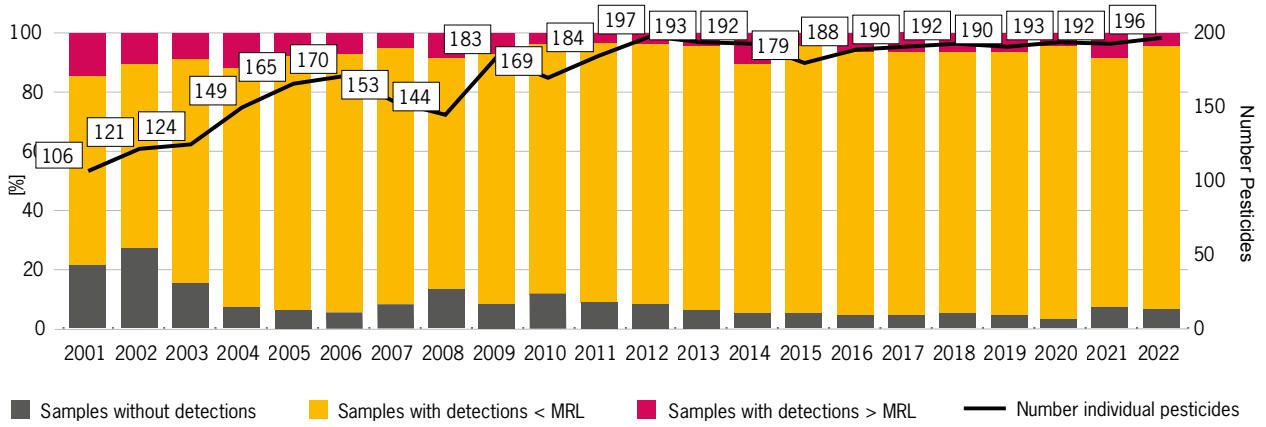
[33] More information on the IPM can be found in this foodwatch analysis: https://www.foodwatch.org/fileadmin/-DE/Themen/Pestizide/Dokumente/Pestizid_Paper_IPM_2022_DIGITAL_FIN.pdf

FOODWATCH ADVOCATES FOR PESTICIDE-FREE GRAIN

Consumer rights and environmental organisations have been campaigning against the frequent contamination of fruits and vegetables with pesticide residues for decades.[34] Residues have been widely known to consumers, retailers and politicians for an extended period. This report aims to shift the focus from pesticides in fruits and vegetables to grains. Given the scale of grain production in the EU, this sector has significant potential for substantial pesticide reduction.

Figure 7

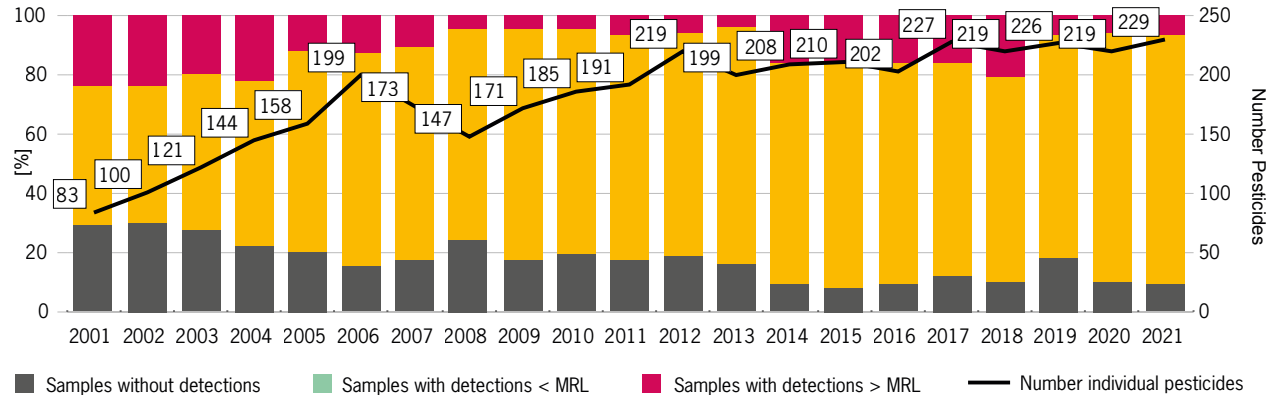
Residues in Fresh Fruit in Germany 2001-2022



Source: CVUA Stuttgart 2002-2023

Figure 8

Residues inVegetables in Germany 2001-2022



Source: CVUA Stuttgart 2002-2023

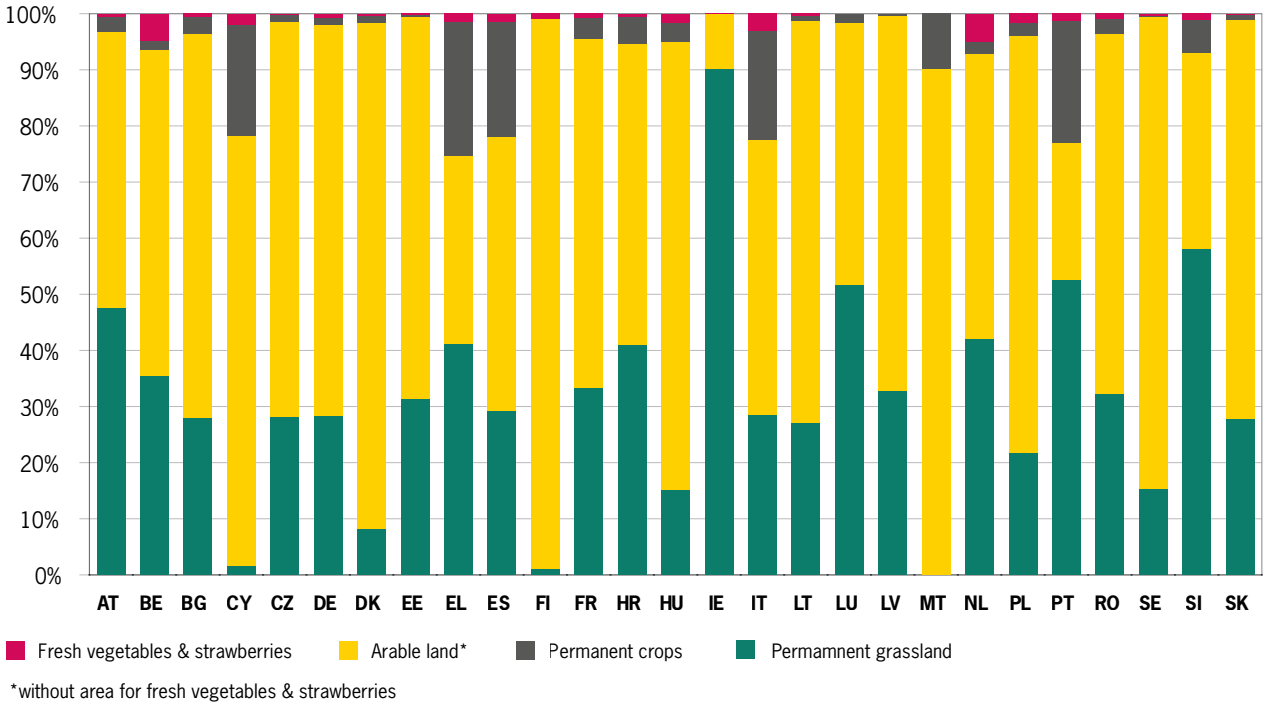
[34] Most recent German organisation BUND report on strawberries: https://www.bund.net/service/presse/pressemitteilungen/detail/news/bund-erdbeertest-giftige-verlockung-im-koerbchen/

Residues in fruits and vegetables remain a problem. **Figure 7** and **figure 8** show all fruit and vegetable samples (in Germany) with positive residue results (green) and residues exceeding Maximum Residue Limits (MRLs) (in red). Over 90% of samples contain pesticides. The number of pesticides has also increased. For example, the number of pesticides found in fresh vegetables has risen from 83 in 2001 to 229 in 2021. It is important to note that this is also due to better detection methods which are able to detect a wider range of pesticides.

However, when examining the total pesticide use in EU agriculture, the share of land attributed to fruits and vegetables is relatively small. The proportion of agricultural land dedicated to a particular crop is the primary factor determining the share of total pesticide usage. The ratio of land use for cereals compared to fruits and vegetables is 26:1 (equivalent to the relative sizes of France and Slovenia).

Figure 9

Distribution of Utilised Agricultural Area (UAA) in the EU Member States (2018)



Source: https://www.foodwatch.org/en/the-failure-of-integrated-pest-management-ipm-in-the-european-union

PESTICIDE RESIDUES IN GRAINS AND MILLED PRODUCTS

Do grain products also contain pesticide residues? Until now, no comprehensive analysis has been conducted to answer this question. The following analysis represents the first thorough examination of official data.

The occurrence of pesticide residues in food is influenced by numerous factors, including:

- Type of application
- Pesticide properties (half-life, metabolism)
- Number of applications
- Timing of applications in relation to harvest time

The latter parameter is often the most critical determinant. The shorter the time between the last pesticide application and harvest, the higher the likelihood of residues.

In EU countries, most final pesticide applications on cereals occur before or during flowering. For instance, glyphosate was frequently used to desiccate all wheat plants shortly before harvest, resulting in elevated residues.[35] While this practice has been restricted,[36] it is still allowed in exceptional cases.[37]

Most other herbicides rarely leave residues because they do not enter the plant and are usually applied early in the season, not directly onto the plant. Grains are also often treated with insecticides during storage.

HOW HAS FOODWATCH EXAMINED RESIDUE LEVELS IN CEREAL GRAINS?

foodwatch used the residue data from all Member States[38] and Norway for the year 2021 (from Zenodo[39]) evaluating them against EFSA's "encryption" catalogue. foodwatch created a list of all sampled foods including the

[35] https://efsa.onlinelibrary.wiley.com/doi/full/10.2903/j.efsa.2018.5263

[36] In France desiccation is banned: https://ecophytopic.fr/pic/pour-aller-plus-loin/glyphosate-du-debut-jusqua-la-fin-programmee#:~:text=Actualit%C3%A9s%20%3A,%C3%AAtre%20achev%C3%A9%20en%20juillet%202023

[37] https://www.isip.de/isip/servlet/isip-de/regionales/rheinland-pfalz/westpfalz/glyphosat-spaetanwendungen-im-getreide-nur-noch-in-ausnahmefaellen-erlaubt--262240

[38] Except Hungary (n=2008 samples taken) because the EFSA data contained obvious errors in relevant fields.

[39] Search ***"results from the monitoring of pesticide residues in food"*** at https://zenodo.org/

detection rate[40] and searched for common European grains and grain-based products (wheat, spelt, emmer, barley, oats, maize, rye). Foods with a sampling number lower or equal to twenty-five, as well as grains without a clear identification of the species, (e.g. grouped commodities such as "Barley and similar", "Wheat and similar") as well samples from organic production[41] were excluded.

Altogether, fifteen grain related food items qualified for evaluation: seven grain types, six flours types, rolled oats and wheat bread and rolls.

RESULTS OF RESIDUE DETECTION IN EUROPEAN GRAINS AND GRAIN-BASED PRODUCTS (WHEAT, SPELT, EMMER, BARLEY, OATS, MAIZE, RYE)[42]

- **Among 2,234 samples, 837 contained one or more pesticides (37%).**
- These contaminated samples contained 1,215 residues from **65 different pesticides.**
- Results ranged from below 10% of samples showing residues (in Emmer grain and rye) to almost 90% (in wheat bread and rolls).
- Flour, rolled oats and bread exhibited higher detection rates compared to unprocessed grains.
- Bread and rolls (both white and brown aggregates) were predominantly tested in Northern Ireland, with almost 90% of the samples containing pesticides.
- Among all 1,215 residues, 18 residues in 14 samples exceeded Maximum Residue Limits (MRLs).[43]

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[40] Since its establishment in 2006, the European Food Safety Authority (EFSA) coordinates residue testing each year among all Member States, Iceland and Norway as part of the European Economic Area (EEA). In addition, EFSA collects data related to pesticide residue testing from these countries. The last reporting year was 2021. Data can be downloaded from "Zenodo" and EFSA provides a multimedia presentation with some key results.

[41] Number of conventional samples taken versus positive conventional samples (excluding residues of ubiquitous environmental contaminants: copper, mercury, bromide ion, which would increase the detections rates)

[42] Indicated by EFSA code "A07SE"

[43] As indicated by evaluation code "J003A"

Figure 10
Detection rate of Pesticides in Grains and Grain Products

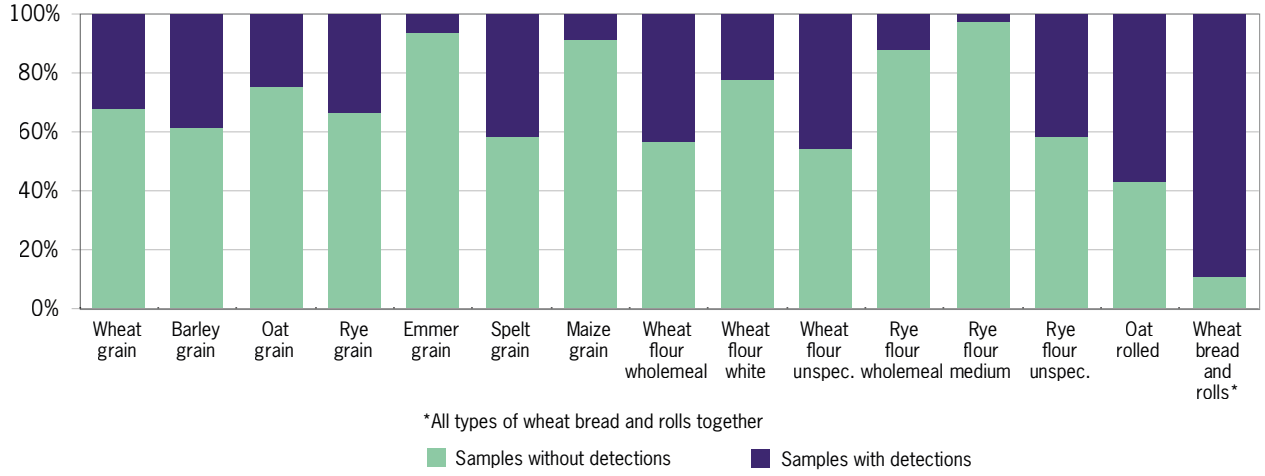
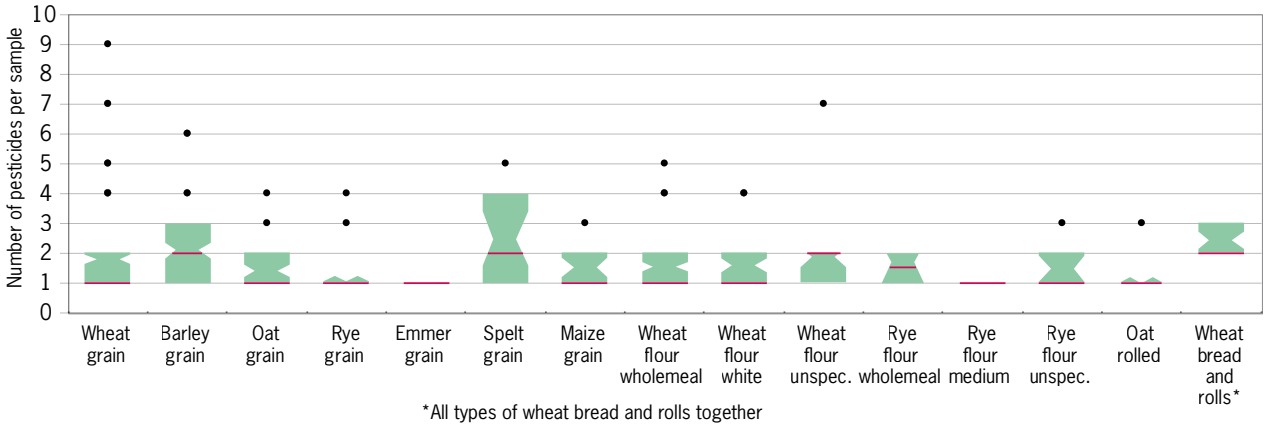


Figure 10 shows the detection variation samples showing residues of 10% (in Emmer grain and rye) to almost 90% (in wheat bread and rolls).

Figure 11
Number of Pesticides found on Grains and Grain Products

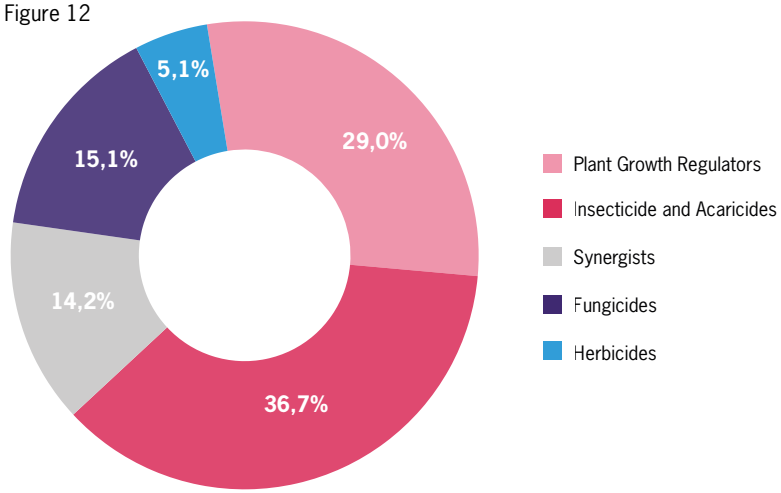


Source: EFSA database, analysed by for foodwatch

Figure 11 shows only samples with residues. The green segment shows the central portion of the data, encompassing values from the lower to the upper middle quartiles. Within this green box, the red line marks the median value of the data. The isolated black dots indicate exceptionally high values, specifically those exceeding the 95th percentile of the dataset.

Figure 12 presents the distribution of the 1,215 residues based on the use type of the detected 65 pesticides:

Figure 12

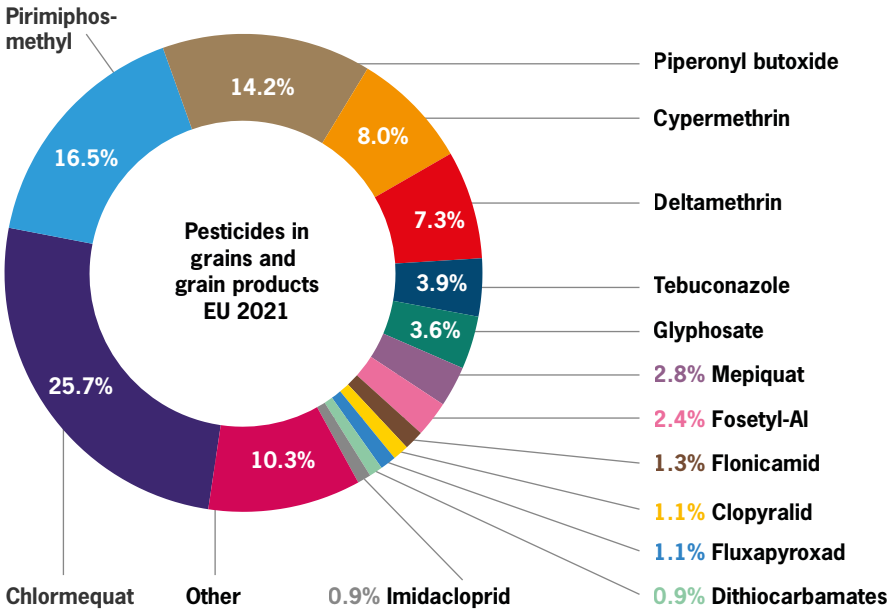


- Insecticides/Acaricides comprise the largest share, followed by Plant Growth Regulators.
- Four pesticides and one synergist (typically included in insecticides) account for over 75% of all residues.

The three top insecticides, acaricides and the synergist[44] are usually applied during storage.

Figure 13

Pesticides in Grains and Grain Products in the EU



[44] A synergist is a substance that is added to enhance the efficacy of the active ingredient in a pesticide product. While the synergist itself may have little or no pesticidal activity, it can increase the potency and toxicity of the active ingredient in several ways.

It is worth noting that grain products receive considerably less attention in terms of pesticide residue analysis compared to fruits and vegetables. However, considering the cocktail effect, in which the combined impact of multiple low-level contaminants is considered, it becomes evident that a comprehensive analysis of all residues is necessary.

COMMON PESTICIDES FOR CEREAL PRODUCTION

Some common pesticides used in cereal production include Chlormequat, Pirimiphos-methyl, Piperonyl butoxide, Cypermethrin, Deltamethrin and Glyphosate.

Chlormequat: This pesticide accumulates in nature and has been found to possess hormone-disrupting properties in certain studies[45]. It functions as a growth regulator.

Piperonylbutoxide (PBO): Classified as a possible human carcinogen by the International Agency for Research on Cancer (IARC). Prolonged or repeated exposure to PBO may pose health risks, including respiratory irritation, skin allergies and potential adverse effects on the liver. PBO is a chemical synergist used in combination with various insecticides and pesticides to enhance their effectiveness.

Pirimiphos-methyl: Prolonged exposure or high doses can lead to health issues such as neurotoxicity, respiratory problems and skin irritation. It is a post-harvest insecticide used on stored maize and millet.

Glyphosate: Classified by the International Agency for Research on Cancer (IARC) as “probably carcinogenic to humans” (Group 2A). Glyphosate-containing pesticides have the potential to destroy almost all wild plants growing in fields.

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[45] https://pubmed.ncbi.nlm.nih.gov/32622971/

PART IV

UNCOVERING THE PESTICIDE POLICIES AND PRACTICES OF SUPERMARKETS

To investigate the commitment of retailers to preserving biodiversity, foodwatch conducted a survey with major retailers in France, Germany, and the Netherlands. The survey focused on the retailers' purchasing policies and strategies concerning pesticide use in the primary production of food. Additionally, foodwatch consulted the supermarkets' websites to gain further insight into their intentions, promises, and goals regarding sustainable agriculture and eliminating pesticide use.

GREEN CLAIMS

Some retailers across Europe include climate and biodiversity advertising in their stores, on their websites, in sustainability reports, or directly on food and packaging. Here are some examples:

- "Wir & Jetzt für Artenvielfalt – mit Edeka zum Bienenretter werden" (Together (literally we & now) for biodiversity – become a bee rescuer with Edeka[46]).
- German retailer Aldi Süd claims to be passionate about bees, stating: "Ohne Bienen wären die Obst- und Gemüseregale in unseren Filialen wie leergefegt" ("Without bees, the fruit and vegetable shelves in our shops would be empty").
- "We also face environmental pollution from pesticides and overfishing. Protecting biodiversity is an important issue for Dirk." [Dirk, Netherlands, Sustainability Report 2022]
- "We make a strong case for preserving the earth's biodiversity." [Jumbo, Netherlands, Annual Report 2022]
- Albert Heijn, the largest retailer in the Netherlands, is saying[47]: "Biodiversity is an important topic for our chains from both close and far away. [...] We work together with growers to reduce the use of the most harmful crop protection products."

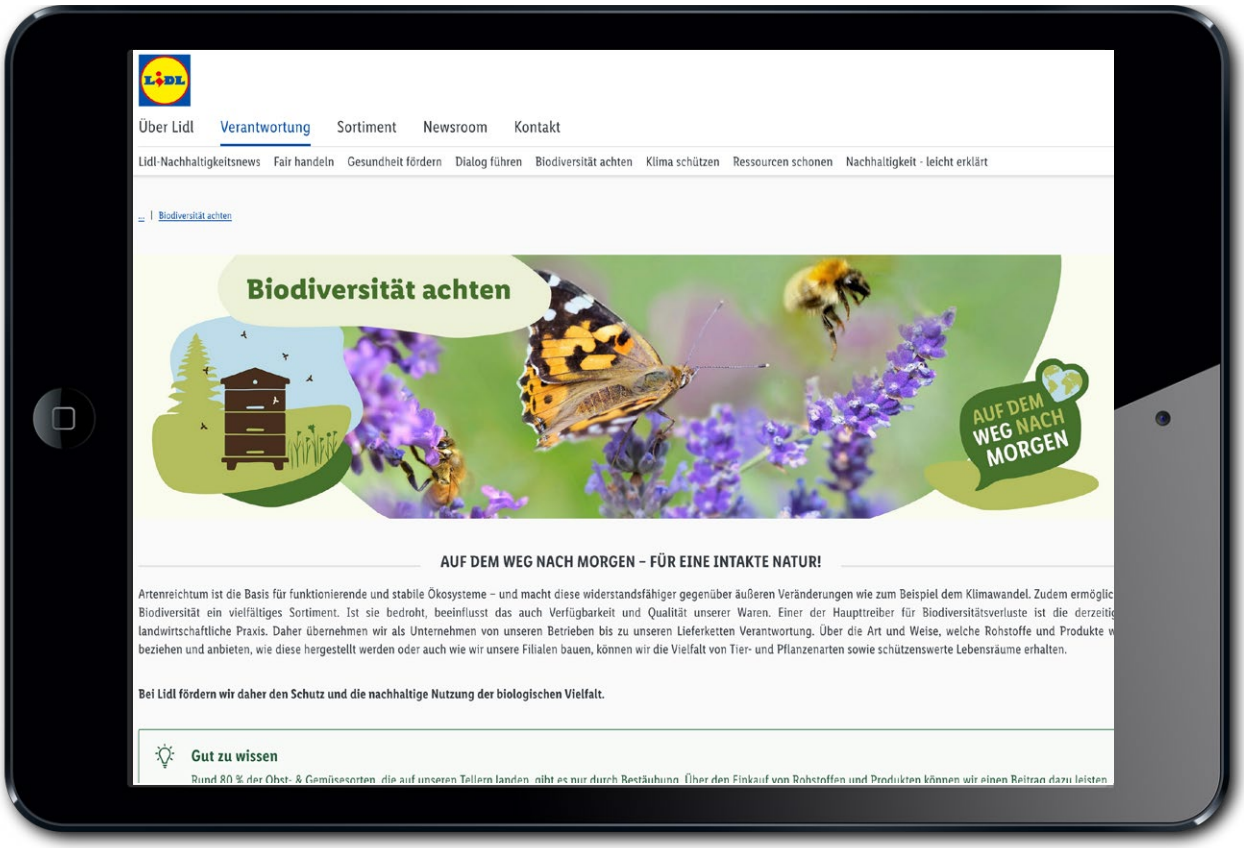
[46] https://verbund.edeka/presse/pressemeldungen/wir-jetzt-f%C3%BCr-artenvielfalt-mit-edeka-zum-bienenretter-werden.html

[47] https://www.ah.nl/over-ah/duurzaamheid/biodiversiteit

German retailer Lidl has made biodiversity a criterion for its suppliers and states that:

"Environmental pollution is to be avoided or at least reduced as far as this is possible with proportionate means. Environmental and climate protection as well as the promotion of biodiversity is an ongoing task that can only be met by constantly improving the level of protection through the permanent reduction of resource consumption and waste reduction. The business partner undertakes appropriate efforts for this purpose within the scope of its business activities.[48]*"*

[48] https://unternehmen.lidl.de/verantwortung/code-of-conduct



SUPERMARKETS IN FRANCE

Supermarkets contacted: Carrefour, Lelcerc, Casino-Monoprix, Systeme U, Intermarché and Lidl.

All retailers claim to have a strategy for pesticides in primary production that involves following specific production rules. However, they primarily focus on fruits and vegetables and aim to reduce usage or the risk of residues. **None of the supermarkets contacted could share a clear and quantified target for pesticide reduction.** French retailers generally lack a holistic approach to pesticides on the products they put on their shelves. Nonetheless, there are some interesting examples retailers are following:

- A certification process with farmers, including restrictions on pesticide use.
- Banning some of the most dangerous pesticides in the production chain.
- Suppressing the use of some pesticides, such as no insecticides on flowering plants or no pesticides seven days before or after harvesting.

However, these strategies primarily apply to fruits and vegetables.

CEREAL PRODUCTS

Strategies for reducing pesticide use in grain products are mostly non-existent or significantly less advanced than for fruits and vegetables. The presence of organic produce on the shelf is the only (insufficient) attempt at the moment to provide pesticide-free products. There are two minor exceptions:

- Carrefour proposes baguettes and pasta of their own brand with some pesticide constraints.
- Intermarché began a more holistic strategy around grain production (for bread), including pesticide reduction and suppression of the most harmful pesticides.

SUPERMARKETS IN GERMANY

Supermarkets contacted: Aldi Nord, Aldi Süd, Rewe, Edeka, Lidl and Tegut. The most relevant German retailers have programs on biodiversity in place.

PROGRAMS ON BIODIVERSITY

Lidl started "Lidl-Lebensräume"[49] (Lidl habitats) with the goal to sensitise people to threatened biodiversity and contribute to the protection of wild bees and other beneficial insects.

Rewe is "committed to biodiversity" and states: ***"Rewe has been committed to bees and other insects and protecting biodiversity since 2010. Because the work of insects is essential to our survival as humans".***[50]

In the program "Agriculture for Biodiversity" ["Landwirtschaft für Artenvielfalt" (LfA)], Edeka, WWF and organic farming organisations work for the protection and promotion of wild animal and plant species in the German agricultural landscape.[51]

Aldi states:
"It is precisely in conventional agriculture that pesticides and toxins are used – with deadly consequences for the insects."[52]

[49] https://unternehmen.lidl.de/verantwortung/gut-fuer-den-planeten/

[50] https://www.rewe.de/nachhaltigkeit/unsere-ziele/projekte/zuhause-fuer-insekten/

[51] https://www.edeka.de/nachhaltigkeit/unsere-wwf-partnerschaft/die-kooperation/landwirtschaft_fuer_artenvielfalt.jsp

[52] https://www.aldi-nord.de/unternehmen/verantwortung/produkte/obst-gemuese.html

Despite the marketing around biodiversity, none of the retailers have assessed the pesticide use for their cereal products. They do not have insight into the impact of grain production on biodiversity.

Tegut admitted most clearly:
"We do not have complete insight into the use of pesticides associated with our range." None of the retailers provided specific data on the amount of pesticides used in their products.

INCREASE ORGANIC

The strategy of all retailers is to increase the range of organic products. Rewe and Penny focus on expanding the offer of organic products.[53] Rewe has its own organic brand, which includes around 800 items. Another strategy of Rewe's strategy is the "Rewe Pioneers" scheme, which seeks to increase its proportion of organic products. Edeka has several projects focused on improving production methods for cocoa, citrus fruits, and bananas. The participating citrus farms reduced the active ingredients by 10,600 litres in 2021, a decrease of over 76 percent.[54]

Aldi Süd agreed that increasing the organic offer is the primary strategy and has extended its range of organic products to 550 organic products, approximately 15% of its range. Tegut also focuses on increasing its organic product range. The proportion of organic fruits and vegetables has reached 51.4%. Tegut also offers the 100% organic "Herzberger" brand for bread. The retailer has an organic share of 43% across the entire range of bread and baking.

[53] https://www.rewe-group.com/de/presse-und-medien/publikationen/positionspapiere/umstellung-von-konventioneller-ware-auf-bio-qualitaet/

[54] https://verbund.edeka/verbund/verantwortung/edeka_wwf_fortschrittsbericht-2022.pdf

MONITORING OF RESIDUES ON FRUIT AND VEGETABLE PRODUCTS

Tegut, Rewe, Edeka (and Metro) and their suppliers are part of the fruit residue monitoring system.[55] German retailers have set their own voluntary residue levels at 50–70% below the European MRLs.[56]

It is important to note here that the allowed residues on fruit and vegetables is still very high[57]. foodwatch demands much stricter residue levels to protect consumers. In addition, various special certifications are obligatory for fresh fruit and vegetable suppliers (e.g., Global Gap, QS GmbH, Rainforest Alliance, GLOBALG.A. P).

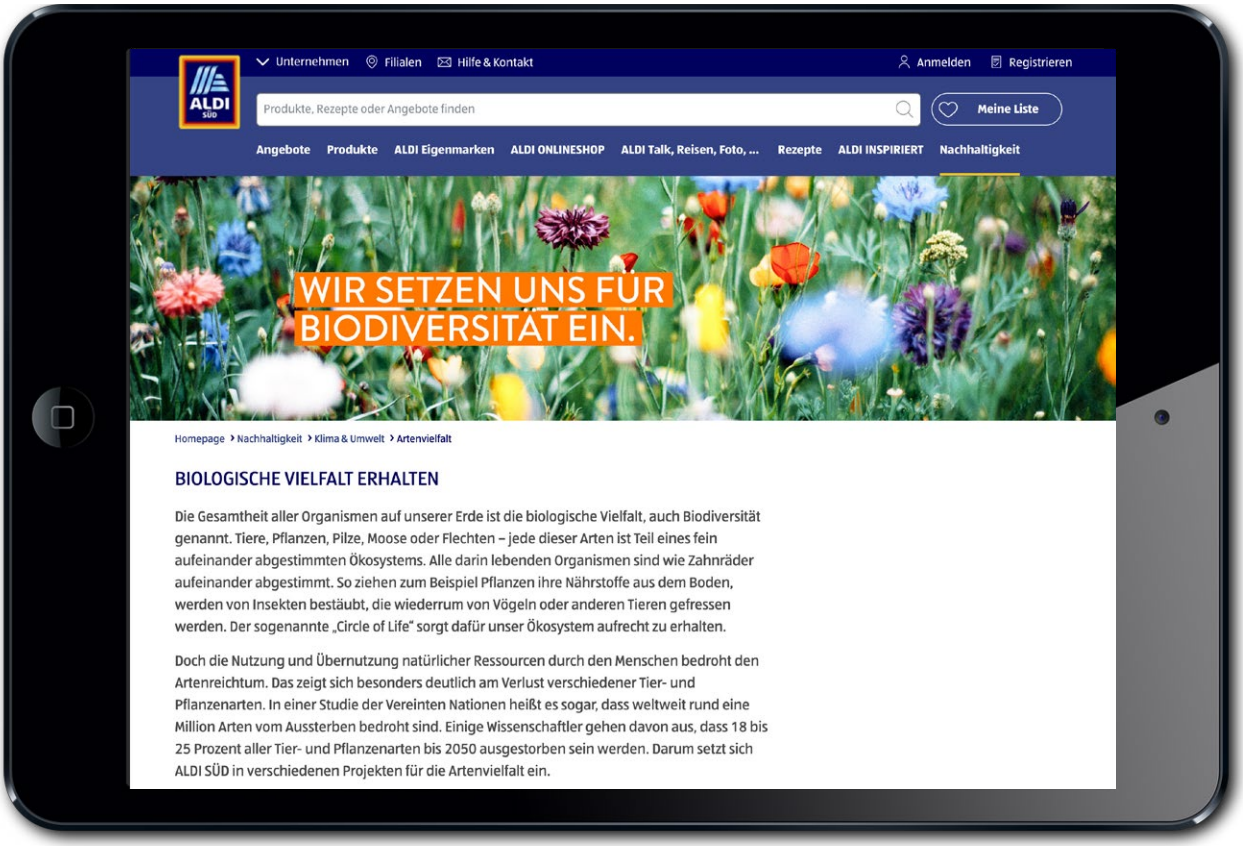
Aldi Süd explained:
"Aldi Süd's suppliers are obliged to demonstrate the quality of their products through residue analyses and safety measures. [...] If the legal and/or Aldi Süd requirements are not complied with, we will inform the suppliers and reserve the right to impose sanctions".

This example shows clearly the power retailers have over producers to change standards.

[55] https://www.fruitmonitoring.com/de/betreiber.html

[56] https://www.cbi.eu/market-information/fresh-fruit-vegetables/germany

[57] https://www.essen-ohne-chemie.info/eu-mrl-2020/



SUPERMARKETS IN THE NETHERLANDS

Supermarkets contacted: Albert Heijn, Jumbo, Coop, Plus, Dirk, Lidl, Aldi, Vomar, DekaMarkt and Spar.

All of the surveyed supermarkets emphasise the importance of sustainable production and/or nature conservation. These claims are reflected in various products with sustainability labels. For example, Jumbo, Dirk, Lidl, Aldi, Vomar, Coop/Plus, and Spar mention selling potatoes, vegetables, and fruit with the "On the way to PlanetProof" label. Albert Heijn highlights their "Better for Nature & Farmer" programs (for dairy farmers, poultry farmers, pig farmers, vegetable and fruit growers). DekaMarkt collaborates with the supplier "Nature's Pride" for this reason (fruits and vegetables).

All supermarkets mention their supra-legal requirements for residues on fruits and vegetables. They apply lower limits than the legal MRL and ARfD limits and/or maintain a so-called black-list for extremely or highly hazardous substances. Starting from 1 July 2023, Aldi has expanded these requirements to the product group of dried fruits, including raisins, in new contracts – thanks to pressure from foodwatch in the Netherlands. Several supermarkets (Albert Heijn, Jumbo, Lidl, Aldi, Spar) explicitly conduct their own testing.

None of the supermarkets mention "pesticide-free products" as a goal. However, all contacted supermarkets offer a range of organically certified products. Some explicitly state they are working to further increase organic offerings, including Albert Heijn, Dirk, Lidl, Jumbo, DekaMarkt, and Coop/Plus.

CEREAL PRODUCTS

Regarding cereal products such as bread, breakfast cereals, and baking products, **no supermarket** mentions a specific strategy to decrease or eliminate pesticide use in production. Their survey responses primarily focus on potatoes, vegetables, and fruit.

Albert Heijn, as part of their commitment to a broader organic offer, mentions that all its own-brand wholemeal pasta has been organic since 2022, and breakfast products are among the most popular organic products among Premium subscribers (a membership with discounts on organic products).

Additionally, a review of the supermarkets' webshops reveals that all supermarkets offer a (limited) organic range of cereal products. They all sell some organic breakfast products, such as organic muesli, oatmeal, or breakfast crackers. However, according to their websites, five supermarkets – Aldi, Dirk, DekaMarkt, Jumbo, and Spar – do not sell organic bread.

HOW DID THE SUPERMARKETS RESPOND TO OUR QUESTIONS?

The responses from all supermarkets are similar. They all claim to act in the interest of biodiversity and health protection, **acknowledging their role and responsibility in pesticide usage**.

However, their primary focus is on fruits and vegetables, partly due to civil society pressure over the years. For fruits and vegetables, most supermarkets have strategies to reduce pesticide usage and minimise pesticide residues on end products. Furthermore, they exert pressure on farmers to adhere to the criteria outlined in their purchasing policies.

There needs to be more attention from retailers regarding reducing pesticide use in grain-based

products. They lack a holistic strategy for products made with grains and do not globally monitor pesticide use for grain products, even though alternatives with fewer pesticides (primarily organic) are available.

Nonetheless, some exciting initiatives regarding grain products are detailed in the upcoming section.

CONCLUSIONS

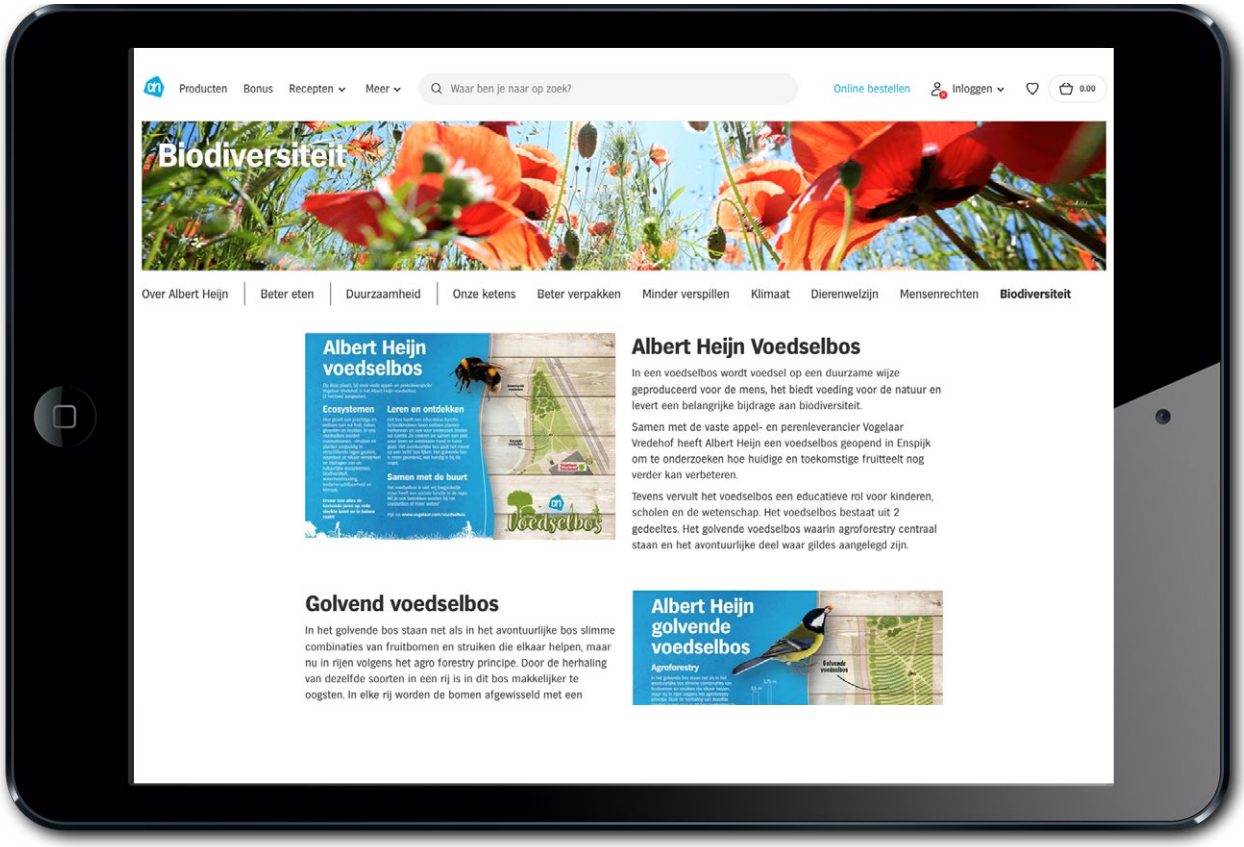
It appears that retailers are aware of their role and influence in reducing pesticide use.

Marketing claims and programs related to biodiversity are particularly prominent in Germany, where there is high societal awareness of species extinction.

However, none of the retailers fully live up to their environmental promises. Despite the extensive land area dedicated to cereal production and the significant pesticide use, none of the retailers have a biodiversity strategy encompassing cereals.

Marketing programs related to bees and biodiversity can be seen as a distraction, potentially misleading consumers into believing that retailers are strategically working to improve biodiversity.

To fulfil their role and align better with their "green" communication, retailers should address pesticide usage in cereal-based products. Consumer pressure, as seen with fruits and vegetables, can be a crucial driver of change in this regard.

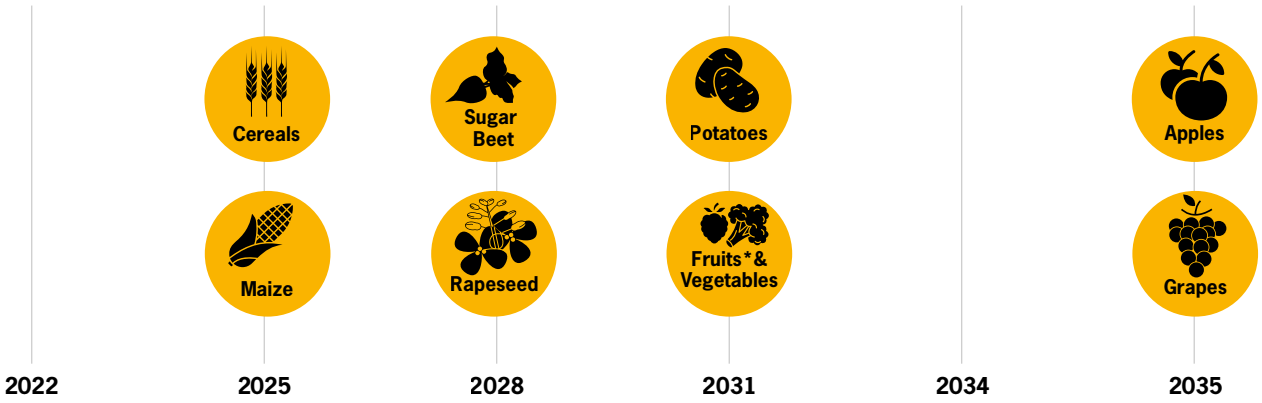


PART V

FOODWATCH'S VISION OF PESTICIDE-FREE FOOD SUPPLY

The vision of foodwatch is to completely eliminate pesticides from agriculture as soon as possible. Why? Because the use of pesticides creates health risks and threatens the food supply in the long run due to its effects on pollinators and ecosystems. In 2022, foodwatch released a report outlining a way to achieve a pesticide-free Europe: a vision that can be realised with a crop-by-crop approach within a decade[58].

Figure 14



Cereal grain crops, such as maize and wheat, are the best place to start as they incur the most significant pesticide use in terms of land cover and overall volume. Cereal grain crops also have the cheapest and easiest solutions available for alternative pest control. A crop-by-crop approach to pesticide-free agriculture focuses on the resilience of our food production while preserving our environment, resources, and human health.

Stopping pesticide use on grain is the fastest and most cost-effective way to save bees, bugs, and weeds. It also helps prevent potential health issues such as cancer, impotence, and depression for farm workers, people living near farms, and consumers.

Our goal is that all grain products sold in supermarkets in the EU are produced without the use of pesticides. Our demand for more clarity and safety for consumers is targeted at retailers across the EU. These supermarkets are the gatekeepers who decide which products they offer and thus significantly impact what suppliers produce.

[58] https://www.foodwatch.org/fileadmin/-INT/pesticides/2022-06-30_Pesticides_Report_foodwatch.pdf

FOODWATCH CALLS ON RETAILERS TO:

- **Commit to take the entire range of cereal and grain products pesticide-free[59] by 2025.**
- **Implement a procurement policy for pesticide-free grain products.**
- **Ensure transparency throughout the process by publishing annual data on which products are produced pesticide-free and which ones are not.**

[59] Pesticide-free production methods distinguish themselves from organic production approaches by including fewer limitations at the field and farm levels. The utilisation of artificial fertilisers remains an option within these methods. Moreover, it is feasible to implement production systems that are partially pesticide-free, allowing for the voluntary transition of specific segments of crop rotations into pesticide-free practices.

The political will to drive legislative change, both at the national and EU levels, is seriously lacking and painfully slow. In 2022, the European Commission proposed some practical first steps of a pesticide reduction strategy in the Sustainable Use Regulation.[60]

However, since then, Member States and some political groups, mainly the European People's Party (EPP), have used delaying tactics and are working to water down and undermine the measures it contains.[61]

Despite the slow political process, this report showcases that pesticide reduction on a large scale is possible in a short time.

"I've worked with a group of farmers for decades to decrease synthetic pesticide use. I've reduced my own use by 80% for 3 years now. Yield decreased by about 10%, but without affecting economic profitability."

– Jean Bernard, a farmer from France[62]

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[60] https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex%3A52022PC0305

[61] https://www.arc2020.eu/epp-attacks-pesticide-regulation-the-nature-restoration-law/

[62] Quote given to "Good food good farming". More examples on the testimonials website https://www.goodfoodgoodfarming.eu/farmers-voices/

PART VI

EXIT PESTICIDES – A SUSTAINABLE FOOD SYSTEM IS POSSIBLE

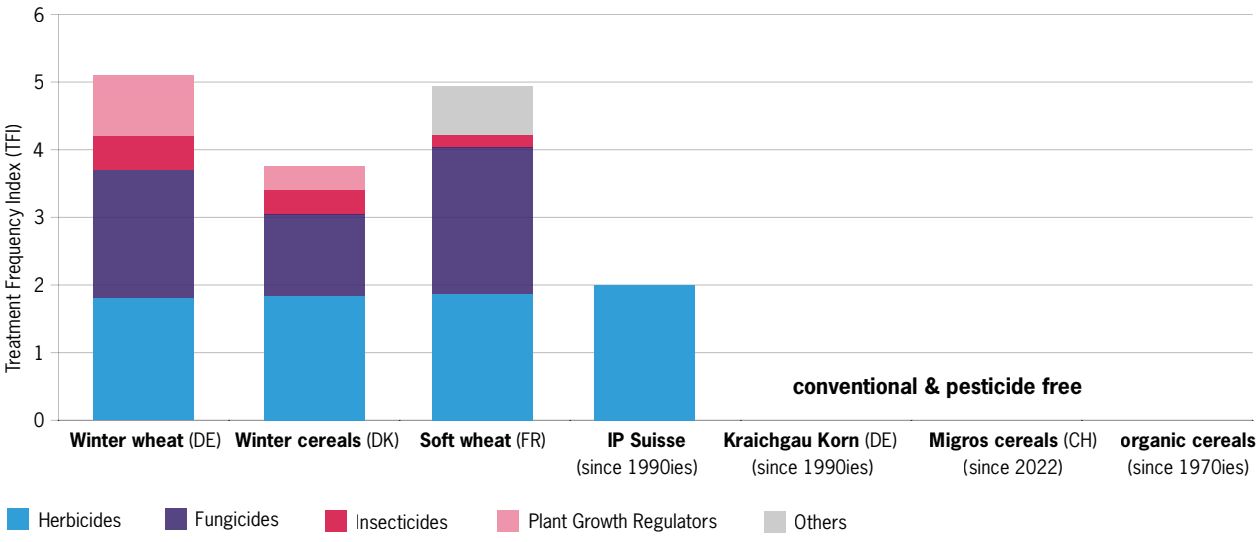
Pesticide-free cereal production is possible and is already happening in Europe.

Migros in Switzerland promotes pesticide-free production through various projects in collaboration with IP Suisse (Swiss Association of Integrated Production Farmers). The retailer aims for completely pesticide-free wheat cultivation. Jowa, the Migros bakery, is already the largest grain buyer in Switzerland, processing 85,000 tonnes of grain from IP Suisse producers every year.[63]

Farmers are compensated for the additional work required for "weeding" through premiums from IP Suisse and direct payments.
It's important to note that the programme phased out growth regulators, fungicides, and insecticides in cereal cultivation, although limited use of herbicides is still permitted.[64]

"We are also continually expanding our range of organic products (ban on synthetic pesticides) and IP Suisse products (strong limitation of pesticides, or pesticide-free production for wheat)," Migros told foodwatch.

Figure 15
Pesticide-Free Wheat Production is Possible: A Comparison Between Production Methods (Producers)



Source: Own graph based on official German (JKI), Danish (Miljøstyrelsen), French (agreste) farm surveys

[63] https://corporate.migros.ch/de/nachhaltigkeit/nachhaltige-produkte/unsere-fortschritte/getreide-huelsenfruechte/brot.html

[64] https://www.ipsuisse.ch/produzenten/pflanzenbau/

Another example of pesticide-free bread comes from **Maurer Bakery**[65] **located in Germany, which has established itself as a pioneer in promoting sustainable and pesticide-free agricultural practices.** The bakery cultivates over 900,000 square meters of arable land in the Rems-Murr district without using pesticides, genetic engineering, or growth regulators.

One of the bakery's standout features is 100% pesticide-free wheat cultivation. This has been made possible by increasing the spacing between stalks in the fields, allowing more light and air to reach the plants. While this approach results in up to a 30% reduction in grain yield, it effectively prevents fungal infestations naturally, eliminating the need for chemical spraying, according to Maurer.

Furthermore, the bakery's corn fields are surrounded by flowering plants, which serve as a habitat for beneficial insects such as bees, bumblebees, butterflies, and even partridges. This example illustrates how responsible business practices can contribute to a healthier planet.

A pioneer is also Kraichgau Korn, a market community of farmers, millers, and bakeries in the south of Mannheim in Germany. The cereals are "100% unsprayed" (100% ungespritzt) and delivered to around 75 bakeries in the region. From seed to the flour the products are checked by a regional independent expert and certified by the regional government.

Kraichgau Korn states:
"By planting wild herbs in our grain fields and creating flower strips all around, we are establishing a haven, especially for endangered insects, and making a significant contribution to preserving biological diversity."[66]

Another interesting case is **Brocéliande**[67]**, a cooperative involving more than 200 breeders located in the western region of France.** Among other products, they offer eggs from chickens that have been fed grains produced without pesticides.

This example is significant considering that, as mentioned earlier, a substantial amount of grain produced in European fields is used as feed for animals such as chickens and pigs.

HOW CAN CEREALS BE GROWN WITHOUT PESTICIDES?

Generally, crop rotation with breaks of at least three years between cereal monocultures is needed to prevent the spread of pathogens and weeds.

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[65] https://baecker-maurer.de/maurerkorn/

[66] https://kkhomepage.kraichgaukorn.de/

[67] https://www.broceliande.fr/fr/12-%C5%92ufs-poule-plein-air.html

Robust varieties of barley, rye, wheat, and triticale[68] should also be selected to avoid pathogen outbreaks.

Late sowing of winter cereals or early sowing of summer cereals can also help reduce the development of pests and diseases. Using green manures (intercrops) between crops can improve soil quality and reduce nitrogen loss. The use of plant growth regulators should be abandoned to prevent overuse of fertilisers and pathogen development. Wider spacing between rows can reduce weed growth and facilitate mechanical weed control.

Maize leaves significant crop residues that can harbour pathogens. Therefore, other cereals should not be grown after maize. Integrating set-aside periods with clover-grass mixtures can help improve the soil and reduce the growth of pests and diseases. Flowering strips at regular intervals across the land can improve biological insect control and facilitate mechanical weed control. Overall, a holistic approach to growing cereals is recommended, aiming to improve the soil and the environment while achieving a healthy harvest. These methods are tried and tested.[69]

WHAT POLICY IS NEEDED?

The **withdrawal of all approvals of plant growth regulators, insecticides, and fungicides for cereals** can effectively reduce the use of chemicals in cereal production and promote the transition to more sustainable farming practices. These uses can be avoided by adopting good agronomic practices (see list above).

Legal restrictions on disease-prone rotations, such as cereals after maize, can also help reduce chemical use and improve soil and crop health. Other policy instruments that can help promote the transition to more sustainable cereal farming practices should include:

- Subsidies and financial incentives for farmers who adopt sustainable farming practices.
- Increasing the costs of current, unsustainable, and externally costly agricultural practices through an EU-wide pesticide tax; a tax on pesticides has successfully decreased pesticide use in Denmark.
- Training programmes for farmers to help them understand and implement more sustainable farming practices.
- Promoting short supply chains and local markets to reduce the need for long transport distances and associated emissions.

[68] Triticale is a hybrid between wheat (Triticum spec.) and rye (Secale spec.). It is exclusively used as animal fodder.

[69] Read more from page 56 in the Lock-In Pesticide report: https://www.foodwatch.org/fileadmin/-INT/pesticides/2022-06-30_Pesticides_Report_foodwatch.pdf

MAKING PESTICIDE-FREE WORK FOR FARMERS

Pesticide-free agriculture requires significant changes in the field. Land use must become more diverse, shifting from monocultures to diverse cultivation with biodiversity.

These radical changes must also benefit farmers. To achieve this, measures at the EU and national levels are necessary to make polluting agriculture more expensive and ensure that farmers earn a higher income from diverse, pesticide-free production.

WHAT WOULD IT COST?

The costs for chemical-free plant protection and manual weeding might be higher per hectare but still small per kilogram of the harvest. In the end, this would probably not significantly affect consumer prices.

In the context of wheat production for bread, the current market price for wheat typically ranges from €0.24 to €0.30 per kilogram. The use of pesticides comes at an approximate cost of €0.02 per kilogram of wheat.

We will consider doubling the expenses associated with these alternative methods in comparison to the conventional use of pesticides.

This means that for mechanical treatment and preventative measures, the projected cost is €0.04 per kilogram of wheat, which is double the €0.02 per kilogram spent on traditional pesticide use. This should not majorly affect the final cost of processed food like bread, which costs €3-€6 per kg.

A concrete comparison of organic and conventional bread in German supermarkets showed that some pesticide-free products can be found at a comparable rate or even cheaper than conventional products. The Edeka spelt bread is cheaper as an organic option. Edeka conventional spelt bread €0.63/100g versus €0.39/100g for the organic option.

However, other products have an unjustifiably higher price as an “organic version” that production costs cannot explain. Rewe whole organic wheat toast is 126 percent more expensive (€2.69/500g) than conventional toast (€1.19/500g). These examples alone show that pricing is not transparent.

The foodwatch report “Locked-in Pesticides” provides comprehensive information on pesticide use in the EU, its economic causes and impacts, and presents a crop-by-crop plan to create a pesticide-free European Union by 2035. You can find the report here: https://www.foodwatch.org/en/news/2022/europes-fatal-dependency-on-pesticides/

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