



THE UNIVERSITY of EDINBURGH
Global Academy of
Agriculture and Food Systems

IDI Data-Driven
Innovation
Part of the Edinburgh & South East Scotland City Region Deal

Pesticides

Photo by [Eric Brehm](#) on [Unsplash](#)

Amelia B Finaret, Honorary Lecturer

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extraordinary futures await

Myths about pesticides

- “It wouldn't be allowed if it weren't safe”
- “Any amount of exposure is harmful”
- “A pesticide only affects the insect or weed that it was designed to affect”
- “There are no long-term effects of pesticide or chemical exposure, only short-term effects”
- “Natural chemicals are safer”

Photo by [Arjun MJ](#) from [Unsplash](#)



There are many types of pesticides

Pesticides protect crops from pests: weeds, insects, fungi, rodents, and bacteria.

- **Herbicides**
 - Kills weeds and other plants
- **Insecticides**
 - Kill insects and arthropods
- **Fungicides**
 - Kill fungi, like blight, mildew
- **Rodenticides**
 - Kill mice and other rodents



Photo by [Laura Arias](#) from [Pexels](#)



Definitions and key concepts

- Pesticides are an important input to agricultural production
- Pesticides can have harmful effects on the environment, human health, and animals.
- Harms from pesticides include reduced biodiversity, residues on food, and contamination of groundwater.
- Pesticides vary widely in their active ingredients, properties, and toxicology.
- There are other tools besides pesticides to boost crop yields.

Photo by Hong Kimvai from Pexels



The WHO describes the problem of pesticide residue in food

- Some pesticides, like DDT, can stay in water and soil for years.
- Pesticides are among the leading cause of death by self-poisoning
- Some pesticides were banned due to their toxicity by the international 2001 Stockholm Convention
- Consumers are less at risk than farmers

Source: WHO, [Pesticide residues in food](#)

Photo by Gilang Dwprayoga from Pexels



An overlooked problem: pesticide exposure of farmers



Photo by Gilmer Diaz Estela from Pexels

- Agricultural workers are at the highest risk of pesticide exposure
- People in the surrounding areas to farms are also at an increased risk
- Workers and anyone spreading pesticide should have adequate personal protective equipment (PPE)
- Pesticide exposure is associated with the development of Type II Diabetes (Jaacks and Staimez, 2015)



Data from the Health and Safety Executive (UK)

The screenshot shows the HSE website's navigation and content. At the top, there is a red header with the HSE logo and the text 'Health and Safety Executive'. A search bar is located on the right side of the header. Below the header is a navigation menu with links for Home, News, Guidance, About HSE, Books, Free updates, and Contact. The main content area has a breadcrumb trail: HSE > Guidance > Industries > Pesticides > Databases Home Page. On the left, there is a sidebar with a 'Pesticides' header and a list of links: Overview, e-approvals, Word Viewer Software and Verification of Digital Signatures, Databases Help, Pesticides Register Database: User Guide, Help: How to use the Garden search, FAQ on Information on Pesticide Products, Crop Definitions List, and LERAP Category A and B descriptions. The main content area features a large heading 'Databases' and a paragraph stating that several databases are available for information. It includes a note about potential time lags between authorisations and their appearance on the website, and a link to 'contact us' for more information. Below this, there is a section titled 'Currently authorised (extant) plant protection products(PPP)' with three bullet points: 'Garden Pesticides Search (Amateur Uses)', 'The Pesticides Register Database', and 'Published 'on-label' e-approvals documents'. Each bullet point provides a brief description of the database's purpose and how to use it.

Health and Safety Executive

Search hse.gov.uk

Home News **Guidance** About HSE Books Free updates Contact

HSE > Guidance > Industries > Pesticides > Databases Home Page

← Pesticides

Overview

e-approvals

Word Viewer Software and Verification of Digital Signatures

Databases Help

Pesticides Register Database: User Guide

Help: How to use the Garden search

FAQ on Information on Pesticide Products

Crop Definitions List

LERAP Category A and B descriptions

Databases

We have made a number of databases available for your information on this website.

Please note there can be a time lag between new authorisations being issued and their details appearing on our website databases. A similar delay can also occur when changes are made to existing authorisations. Please therefore [contact us](#) if you wish to be absolutely sure that the information you are looking for is the most up to date.

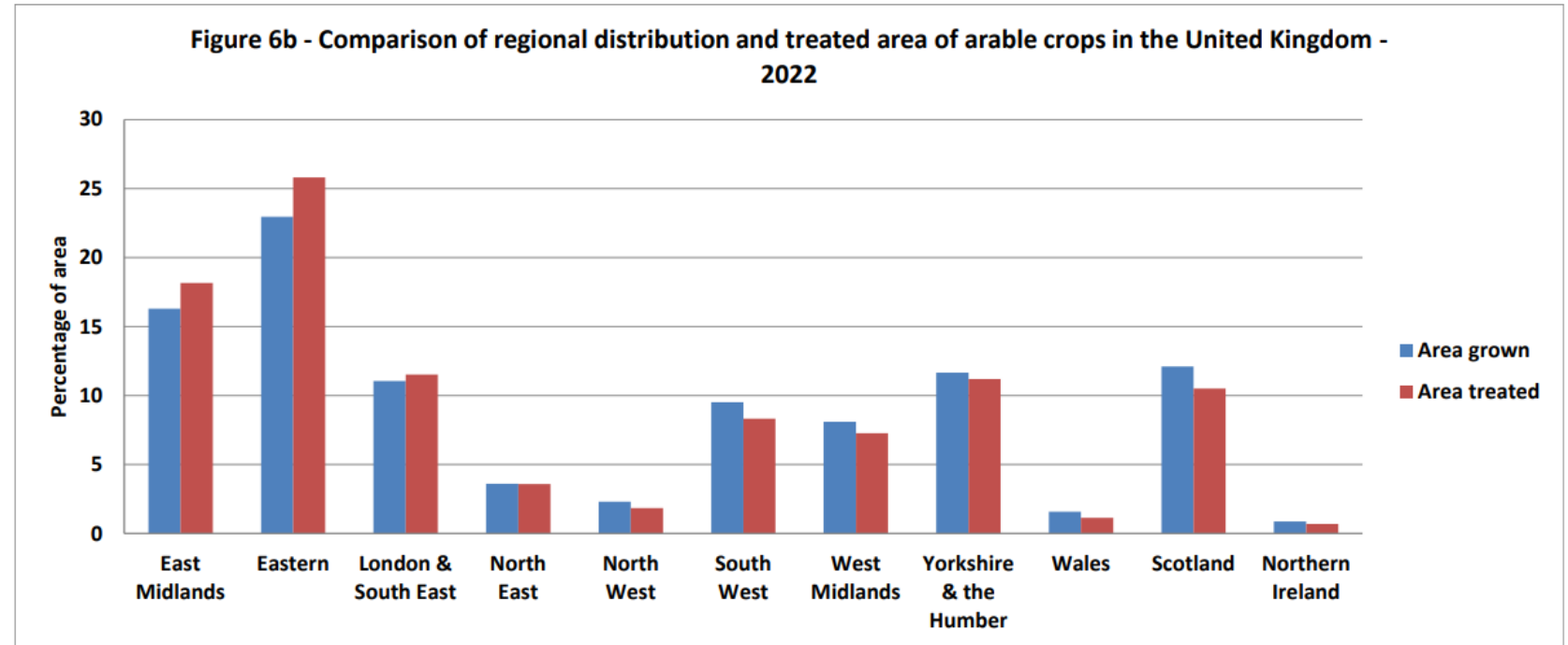
Currently authorised (extant) plant protection products(PPP)

- ▶ [Garden Pesticides Search \(Amateur Uses\)](#)
Search for currently authorised products for use by amateurs (non-professionals). You can search for the plant/area to be treated, the product name, marketing company, active substance, MAPP number (registration number), or type of PPP. A user guide is available to aid searching.
- ▶ [The Pesticides Register Database](#)
Search for extant PPP with on-label authorisations. The [User Guide](#) provides helpful information on the type of searches you can do.
- ▶ [Published 'on-label' e-approvals documents](#)
Database shows documentation issued since 2005 for a particular PPP including authorisations (or permits), amendments to authorisations and withdrawal notices. This includes products that have expired and are no longer authorised. You will need to know the MAPP (registration) number or name of the product for the public search facility.



Pesticide usage survey reports

- **Fera Science** (formerly Food and Environment Research Agency) publishes Pesticide Usage Survey Reports, with charts of data



Source: L. Ridley, G. Parrish, T. Chantry, A. Richmond, R. MacArthur & D. Garthwaite. Arable Crops in the UK. 2022.



Data from the USDA

The screenshot displays the USDA National Agricultural Statistics Service (NASS) website. The header includes the USDA logo, the text "United States Department of Agriculture National Agricultural Statistics Service", and social media icons for Twitter, YouTube, RSS, and Facebook. A search bar labeled "Search NASS" is present. The navigation menu includes "Data & Statistics", "Publications", "Newsroom", "Surveys", "Census", "About NASS", "Contact Us", and "Help". The breadcrumb trail reads "You are here: Home / Surveys / Guide to NASS Surveys / Chemical Use". A "Statistics by State" dropdown menu is visible. The main content area is titled "Surveys" and features a green banner for the "Agricultural Chemical Use Program" with an image of a tractor in a field. Below the banner, text describes the program as USDA's official source of statistics on on-farm chemical use and pest management practices since 1990. It lists crops surveyed, including fruits, vegetables, cotton, corn, potatoes, soybeans, wheat, and nursery/foriculture crops. It also mentions that the program collects data on pest management practices to reduce dependence on agricultural chemicals. A "Respond Online" section includes a mobile phone icon and a link to "complete your survey online", noting that a unique survey code is required for sign-in. At the bottom, three buttons are provided: "Get the Data", "Methodology and Quality Measures", and "About the Survey".



The OECD provides data on laws and policies for pesticides in several countries



Pesticide Compliance and Enforcement

ENV Pesticide Compliance

[Home](#)

[Laws, Policies & Guidance](#)

[Compliance Programmes](#)

[Border-related Activities](#)

[Key Issues](#)

[Country Pesticide Authorities](#)

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[Tools and Resources](#)

[ENV Pesticide Compliance](#) · [Laws, Policies & Guidance](#)

Laws, Policies & Guidance

The focus of this page is the laws, regulations, policies, and guidance that regulatory authorities have issued as final or proposed for the purpose of addressing compliance and enforcement issues. This section contains country specific information on Compliance and Enforcement approaches and frameworks from the various countries:

- National legislation and regulations relevant to government pesticide programs
- Compliance risk assessment and performance measurement frameworks
- Compliance and enforcement policies
- Guidance documents
- Legal sampling procedures

The following links were provided by the regulatory authorities of countries listed below:

[Australia](#) · [Belgium](#) · [Canada](#) · [Germany](#) · [Ireland](#) · [Japan](#) · [The Netherlands](#) · [Switzerland](#) · [United States](#)



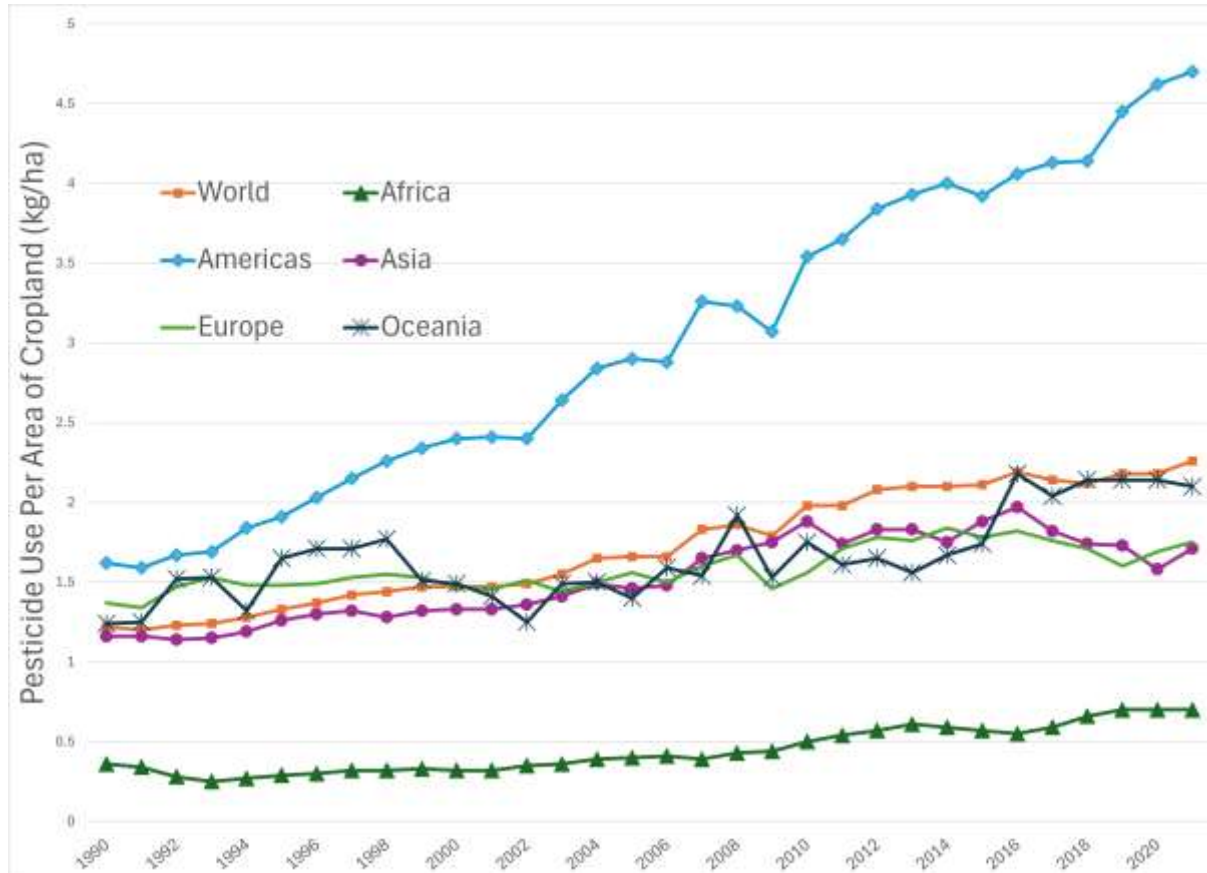
Food and Agricultural Organization Data

- Data include the use of major pesticide groups: insecticides, herbicides, fungicides, plant growth regulators, and rodenticides.
- Can search by active ingredients
- Data are reported for all countries from 1990 onwards.
- Data can be viewed as the total, or use per person, per area of cropland, or per value of agricultural production.

The screenshot shows the FAO Pesticides Use data interface. At the top, there is the FAO logo and the text "Food and Agriculture Organization of the United Nations". Below this, the "FAOSTAT" logo is visible. The main navigation bar includes "Data", "Selected Indicators", "Compare Data", "Definitions and Standards", and "FAQ". A search bar is present on the right. The current page is titled "Pesticides Use" and has a "Back to domains" button. Below the title, there are tabs for "DOWNLOAD DATA", "VISUALIZE DATA", and "METADATA". The interface is divided into several sections: "COUNTRIES" with a search filter and a list of regions (Melanesia, Micronesia, Polynesia) and their "Total" and "List" options; "ELEMENTS" with a search filter and a list of indicators (Agricultural Use, Use per area of cropland, Use per capita, Use per value of agricultural production); and a "Bulk Downloads" section on the right with a table of download options.

Download Option	Size
All Data	164 KB
All Data Normalized	850 KB
All Area Groups	55 KB
Africa	103 KB
Americas	114 KB
Asia	108 KB
Europe	142 KB

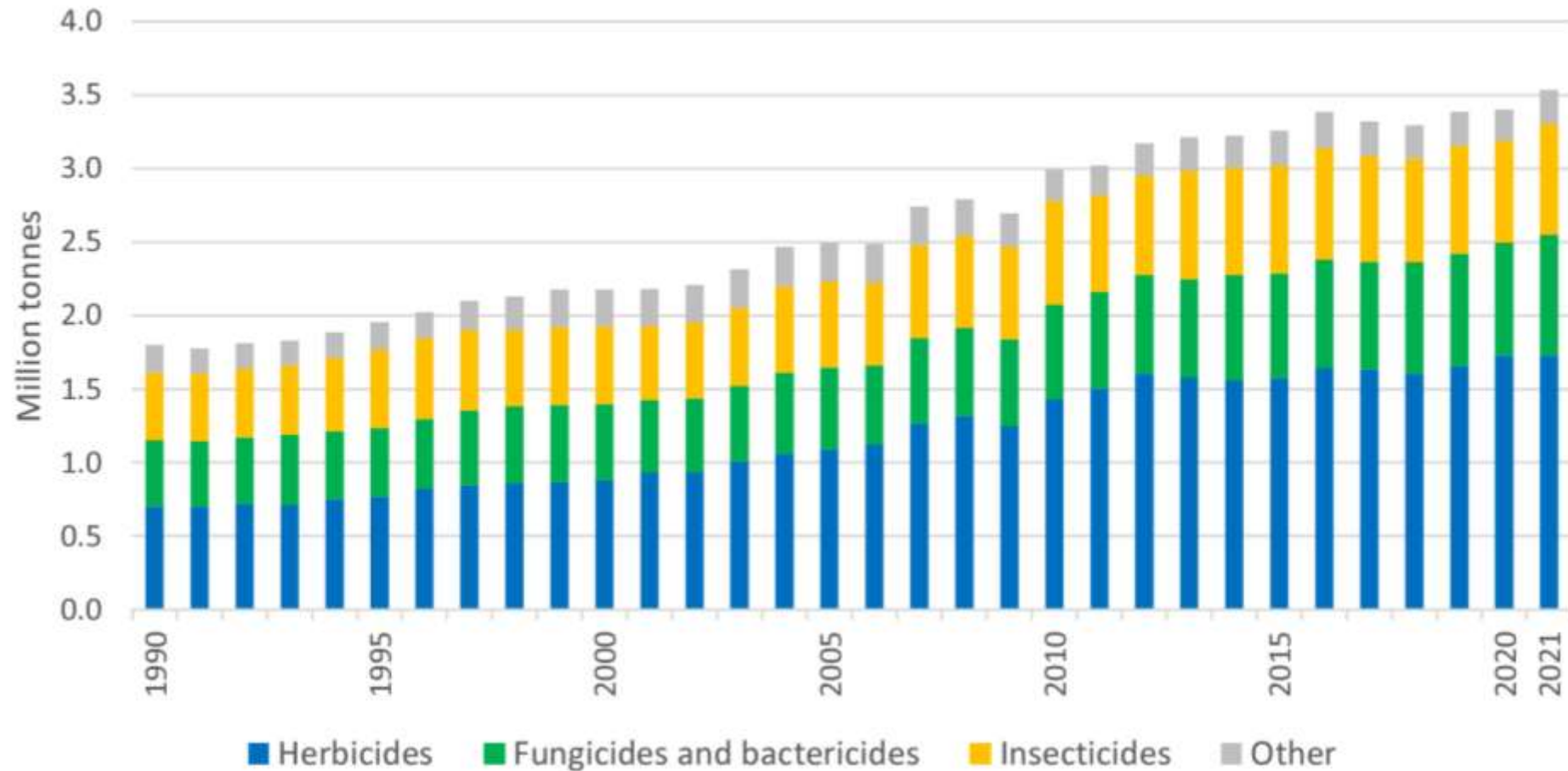
Food and Agricultural Organization Data



- People who are interested in pesticide data can make their own charts or use the built-in data visualization tool from the FAO website.



Figure 1: Global pesticides use by category



Source: FAO. 2023. Pesticides Use. In: FAOSTAT. Rome. [Cited July 2023]. <https://www.fao.org/faostat/en/#data/RP>



Data and resources

- [FAO data on pesticide use](#)
- UK Health and Safety Executive - [Pesticides](#)
- [Fera Science](#)
- USDA – NASS [Agricultural Chemical Use Data](#)
- OECD [Laws, Policies, and Guidance](#)



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Thank you

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