MINISTRY
OF ECOLOGY
TRANSITION AND
TERRITORIAL
COHESION
Liberté
Égalité
Fraternité

DATA Essential LAB ENVIRONNEMENT

Overview of sales and purchases of crop protection products in France in 2021

APRIL 2023

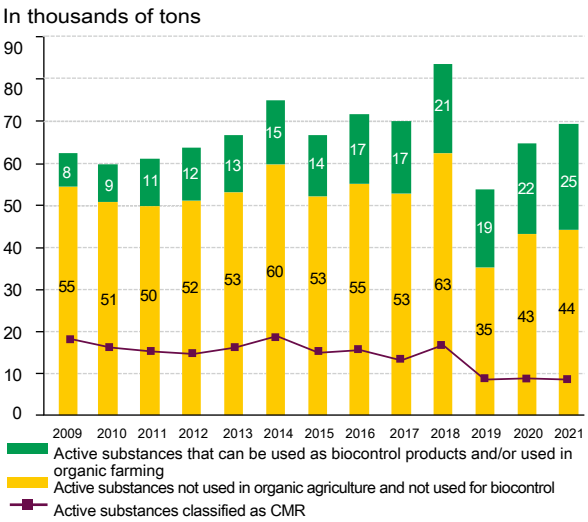
During the 2010 decade, sales of plant protection products, remained at high levels. However, sales of active substances that are not used in organic agriculture or in biocontrol have decreased (-17% between 2009-2010 and 2020-2021).This is also the case for sales of molecules classified as being of highest concern. The share of active substances classified as carcinogenic, mutagenic and reprotoxic (CMR) has decreased from 27% to 11% between 2009 and 2021. 44% of substances sold are herbicides. The mapping of sales largely reflects local agricultural specializations.

The data from the National Sales Bank supplied by the distributors of plant protection products (BNV-D) concern the quantities of active substances contained in plant protection products and do not take into account adjuvants (*see methodology*). The quantities of active substances sold or purchased do not necessarily reflect the location, the quantity applied or the period of application of the treatments (possibility of stockpiling, link between the purchaser and the postal code of his place of business).

DECREASE SINCE 2009 IN SALES OF ACTIVE SUBSTANCES NOT USED IN ORGANIC AGRICULTURE OR IN BIOCONTROL

During the 2010 decade, the total quantity of active substances sold in France increased (+16% between 2009-2010 and 2020-2021) while the utilized agricultural area (UAA) remained stable (-0.8%). Close to 63,000 tons (t) over the period 2009-2013, sales have averaged around 70,000 t since 2014, with marked annual fluctuations, linked to climatic effects and storage behavior (*Graph 1*). Sales of active substances thus peaked in 2018 (84,000 t, or +20% compared to 2017), followed a sharp drop in 2019 (54,000 t, or -36%

Graph 1: Evolution of total quantities of active substances sold by type of use



Note: CMR = substances considered the most toxic "Carcinogenic, mutagenic and reprotoxic".
Coverage : France as a whole.
***Source:** BNVD - distributor Insee code sales data extracted for 2009 to 2019 data on 11/27/2020 and 2020 and 2021 data on 10/17/2022. Processing: OFB, 2022 and SDES, 2023*

compared to 2018), due to anticipated purchases at the end of 2018 in anticipation of the increase in the non-point source pollution tax rate at the beginning of 2019. In 2021, sales are set at 69,500 t, close to the average value for 2014-2020.

The evolution of sales by type of use makes it possible to distinguish between so-called conventional substances whose reduction is sought and substances that can be used in organic farming farming and biocontrol products whose use is expected to increase.

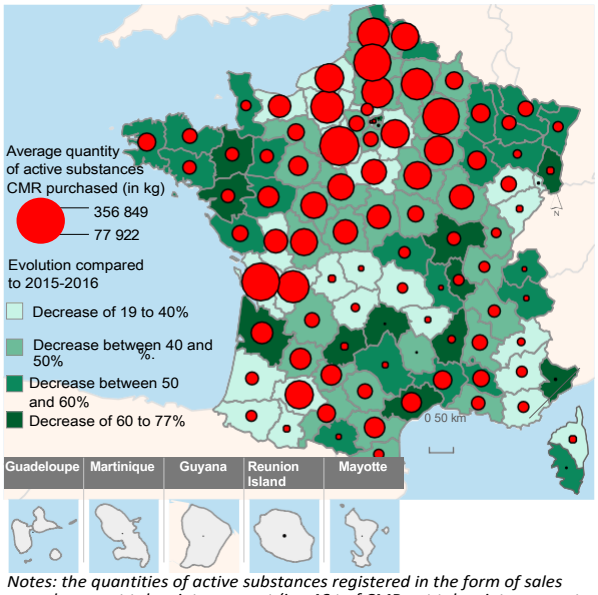
Overall, the quantities of active substances sold that are not used in agriculture Organic and sales

decline between 2009 and 2021. The quantities sold decrease by 17% between 2009-2010 and 2020-2021, with the biennial value for 2020-2021 being lower (44,000 t) than the average for the decade 2009- 2019 (53,000 t). As for the quantities of active substances sold for use in organic agriculture and/or biocontrol products, they have almost tripled between these two periods, rising from 8,400 t to more than 23,000 t. In 2021, 2% of sales related to products "autorised for use in gardens" - (*see methodology*).

11.3% OF SALES RELATE TO SUBSTANCES OF HIGHEST CONCERN

The evolution of the proportion of substances of greatest concern for human health shows a general downward trend since 2009. Between 2009 and 2021, the proportion of active substances classified as carcinogenic, mutagenic and reprotoxic (CMR) has halved from 29.2% to 11.3% (*Graph 1*). In France, the quantities of the most toxic active substances have decreased by almost 47% between the periods 2015-2016 and 2020-2021. 17 departments account for more than half of the quantity of active substances classified as CMR purchased over the 2020-2021 period (*Map 1*). With 357 t in the 2020-2021 biennial average, Eure-et-Loir totals the largest quantity of the most toxic plant protection products purchased (-32.9% compared to 2015-2016), followed by Charente-Maritime (338 t, with -23.2%), Somme (324 t, with -49.3%), Marne (316 t, with -48.7%), and Eure (256 t, with -36.5%). The department where the decrease is the greatest is Gironde with 72% fewer

Map 1: 2020-2021 biennial average purchases of active substances classified as the most toxic by department



Notes: the quantities of active substances registered in the form of sales records are not taken into account (i.e. 46 t of CMR not taken into account out of the 7,857 t of CMR sold in total in 2021); CMR = substances considered the most toxic "carcinogenic, mutagenic and reprotoxic"; the quality of the data does not allow for an analysis of the evolution of purchases within the overseas departments.
***Source:** BNV-D, data from 2015 to 2021 at the buyer zip code, extracted from 2015 to 2019 on 11/26/2020 and from 2020 to 2021 on 10/17/2022. Processing: OFB, 2022 and SDES, 2023*

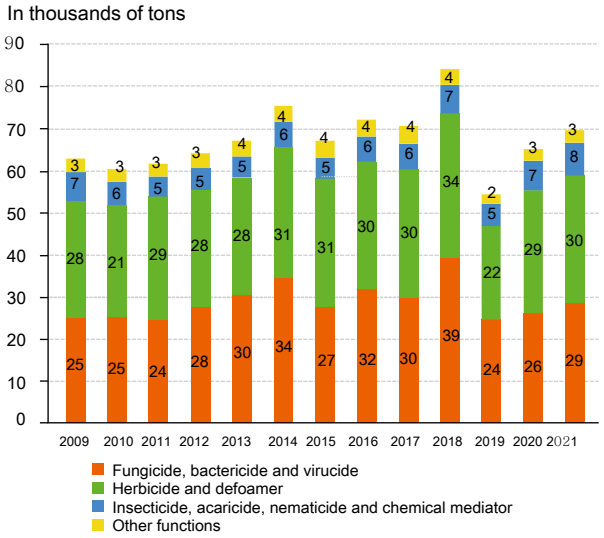
active substances of greatest concern used. In particular, there has been an 89% decrease in mancozeb purchases. This decrease is 62% at the national level following the ban on its marketing on January 1, 2021, despite a transition period of one year for the disposal of stocks. Some crops, such as potatoes, which are mainly present in the north of France, or vines, in wine-growing areas, are treated more with fungicides.

44% OF SUBSTANCES SOLD ARE HERBICIDES

In 2021, herbicides will represent 44% of the substances sold, fungicides 41%, insecticides 11%, and the remaining 4% will be made up of other products, such as growth regulators.

Between 2009-2010 and 2020-2021, the quantities of fungicides sold increased by 9%, as did those of herbicides; those of insecticides increased by 20%, while sales of other products decreased by 7%. Sanitary and climatic conditions influence these consumptions: the increased use of fungicides is observed in years with high rainfall (such as 2014 and spring 2018), while years characterized by high temperatures, such as 2020 and 2021, are favorable for insects (*Graph 2*). The distribution of sales by function, by type of use, by toxicity for the 10 most sold substances in France is available at different scales of the BNVD datavisualization tool.

Graph 2: Evolution of sales of active substances by function



Notes: other uses = growth regulators, molluscicides, rodenticides, repellents, taupicides, and others including unknown functions; biennial average incorporates all functions; seed treatments were only included in the NVB-D from 2012 and represent less than 1% of active substances sold in 2021. Coverage: France as a whole.
***Source:** BNVD - distributor Insee code sales data extracted for 2009 to 2019 data on 11/27/2020 and 2020 and 2021 data on 10/17/2022. Processing: OFB, 2022 and SDES, 2023*

HIGH HERBICIDE CONSUMPTION IN NORTHERN FRANCE

As in 2020, the Grand Est, Nouvelle-Aquitaine, Hauts-de-France and Centre-Val de Loire regions were the regions where the most herbicides were sold in 2021 (*Map 2*).

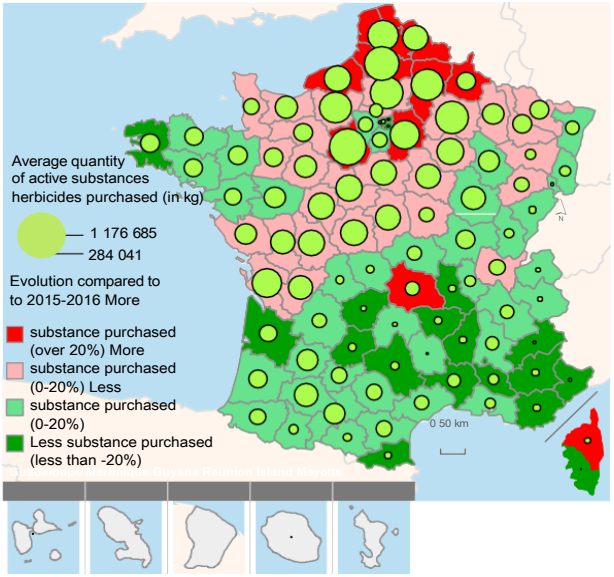
At the departmental level, 20 departments account for more than half of the quantity of herbicides purchased over the period 2020-2021 (*Map 2*). With an average of more than 1,000 t per year. In 2020-2021, Eure-et-Loir (1,177 t) and Somme (1,051 t) have the largest quantity of herbicides purchased, ahead of Marne (947 t), Oise (942 t) and Aisne (898 t).

Even if the purchase data do not directly reflect the uses, the nature of the crops and the agricultural area that characterize these departments are among the important explanatory factors. For example, Marne is the department with the largest utilized agricultural area (UAA) at the time of the last agricultural census in 2020, with 556,000 hectares (ha), more than double the national average (270,000 ha). Aisne, Somme and Eure-et-Loir also have more than 400,000 ha of UAA (respectively 493,000 ha, 457,000 ha and 446,000 ha of which 488,000 ha, 456,000 ha and 445,000 ha are land arable land).The arable land corresponds mainly to field crop production for which herbicide treatments are important, even if they are also carried out on grassland and permanent crops.

If we refine the analysis, the Aisne, as well as the Marne, Somme, Pas-de-Calais and Oise are the top five departments in terms of beet acreage. According to the Ministry of Agriculture's 2017 field crop surveys, the average number of treatments for beet is herbicides which is 13.7, compared to 2.9 on soft wheat.

In 39% of the departments, the quantities of herbicidal active substances purchased are higher for the period 2020-2021 than for the 2015-2016 period (*Map 2*).

Map 2: 2020-2021 biennial average herbicide purchases by department



Notes: of a total of 29,323 mt of herbicidal active substances purchased in 2021, 187 mt (or 0.6%) were entered with a zip code of 00 or 00000; therefore, the purchasers corresponding to these sales are not locatable. ***Source:*** *BNV-D, 2015 to 2021 data at buyer zip code, extracted from 2015 to 2019 on 11/26/2020 and from 2020 to 2021 on 10/17/2022. Processing: OFB, 2022; SDES, 2023*

This mainly concerns departments located in the northern half of France. These changes can be linked to climatic variations, changes in the nature of crops, and changes in the herbicide products used. The most frequently sold herbicides are glyphosate, prosulfocarb, pendimethalin and S-metolachlor, but others have increased rapidly in recent years. This is the case for pelargonic acid, a biocontrol product that is very often advocated as an alternative to glyphosate: average sales of pelargonic acid in 2020-2021 are 627 t, which is almost 10 times the 2015-2016 average (65 t). Ranking 10th in herbicide sales in France in 2021, pelargonic acid represents only 1% of total herbicide purchases on average in France over the period 2020-2021, but the distribution of its purchases across the country is contrasted. Its share amounts to 10% in Puy-de-Dôme and 5% in Calvados, the two departments where the quantity purchased is the highest. The dosage per hectare of this herbicide is important: for the same surface treated, the quantity of active substance is higher when using pelargonic acid than for a "classic" herbicide.

Glyphosate, the most used herbicide

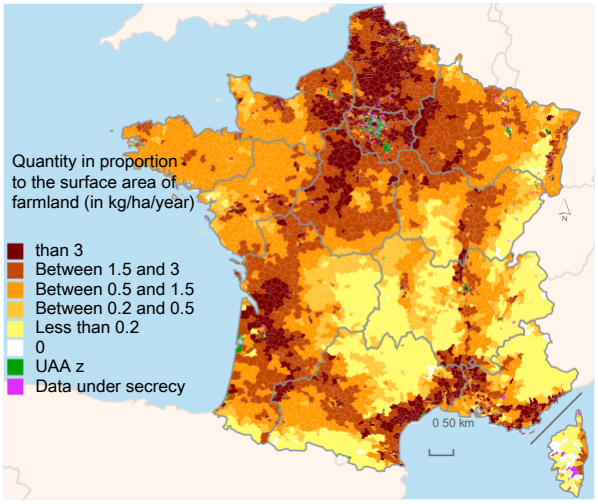
Glyphosate is a member of the amino-phosphonate or organo-phosphorus family. It is a total foliar systemic weed killer, i.e. a non-selective herbicide absorbed by the leaves and having a generalized action. The expiry of the patent, which fell into the public domain in 2000, led to the manufacture of numerous generics as well as to the reduction in price of this herbicide and its widespread use. Until 2011, glyphosate was also known as n-phosphonomethyl glycine. The molecule and/or the products containing it are classified as toxic to aquatic organisms, leading to long-term effects. Given the uncertainties concerning the dangerousness of this substance and, in particular, its carcinogenic nature, France has committed to a plan to phase out glyphosate. After sulfur, which is used in conventional and organic agriculture to the tune of 15,000 t, it is the second most used active substance in France: 7,900 t sold in 2021, 8,600 t sold in 2020, 6,100 t in 2019 and 9,700 t in 2018, i.e. 12% of total annual sales over the period 2016-2021. Over the period 2009-2021, it is also the most sold herbicide at the national level among the 120 active substances for herbicide use, with a relatively stable share, around 28 %. Banned for individuals since 2019, sales of glyphosate authorized for use in gardens, glyphosate are now very low and correspond to those of professionals looking for a smaller package.

A USE OF ACTIVE SUBSTANCES CLOSELY LINKED TO LOCAL AGRICULTURAL SPECIALIZATIONS

Since 2015, the quantities of active substances sold have been reliably available at the buyer zip code level. In the case of agricultural uses, since the buyer is required to report the zip code of his or her farm headquarters, this information does not provide precise information on where or when the purchased products were applied. The exploited parcels can indeed be located in communes having another postal code and the products can be stored.

Maps 3 shows the 2020-2021 average of purchases of active substances excluding organic farming uses and biocontrol products in the buyer's postal code, based on the UAA of farms located in the postal code area concerned. The zip codes concerned by the highest purchases in relation to the UAA of farms are often those located in areas of field crops (cereals, oilseeds) or other field crops (potatoes, beet) and permanent crops (viticulture, fruit or other permanent crops) — (*Maps 3 and 4*).

Map 3: annual quantity of purchases of active substances not used in organic farming and not used for biocontrol, in relation to the UAA, by postal code, on average over the period 2020-2021

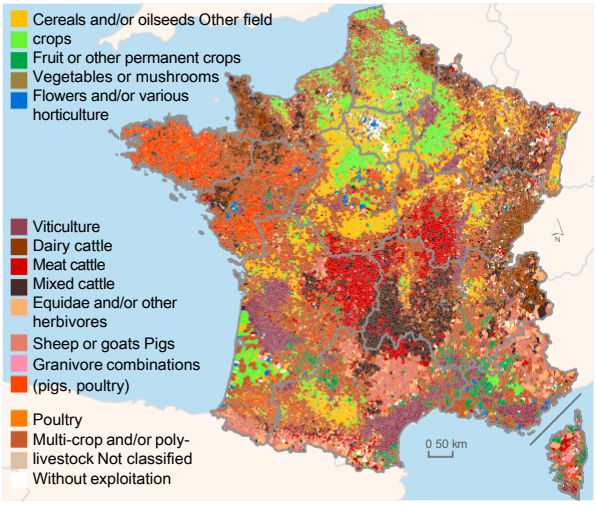


Note: quantity of purchases of active substances (excluding uses in organic farming and biocontrol products) in the buyer's postal code, compared to the UAA of the farms with their headquarters in the area of the postal code concerned (excluding postal codes where the number of farms is less than or equal to 5).
***Sources:** Agreste, 2020 agricultural census; BNV-D, 2020 and 2021 purchase data by buyer zip code, extracted on 10/17/2022. Processing: OFB, 2022 and SDES, 2023*

METHODOLOGY

In the BNV-D, sales data by distributor Insee commune code have been available since 2009 and sales data by buyer zip code have been available and reliable since 2015. Reporting by buyer postal code is only mandatory when distributors sell to professional users (*see the detailed methodology associated with the publication).*

Map 4: Distribution of technical-economic orientations (OTEX) by commune in France in 2020



***Source:** Agreste, agricultural census, 2020. Processing: SDES, 2022*

Sales data from 2009 to 2019 and purchase data at the buyer zip code from 2015 to 2019 were extracted on 11/27/2020 and 11/26/2020, respectively. Sales data and purchases data at the buyer zip code for 2020 and 2021 were extracted on 10/17/2022.

Plant protection products can be sold under two main categories of use, depending on whether they are marked "authorized for use in gardens" or not. Only people who can prove their status as professional users and who have a certificate of aptitude (Certiphyto) can buy "non-authorized for use in gardens" products.

TO KNOW MORE ABOUT IT

- Data visualization tool for sales and purchases of active substances
- Glyphosate website of the Ministry of Agriculture
- NODU site of the Ministry of Agriculture
- EcophytoPic website
- Environment and agriculture - key figures - 2018 edition, CGDD/SDES, *Datalab*, June 2018, 122 p.
- Agreste Chiffres et Données

Sandrine PARISSE, SDES

Legal deposit: April 2023
ISSN : 2557-8510 (online)

Publication Director: Béatrice Sédillot **Editorial coordination:** Claude Baudu-Baret
Cartography: Antea
Design and production: Agence Citizen Press

General Commission for Sustainable Development
Statistical Data and Studies Department
Sub-Directorate for Environmental Information
Tour Séquoia - 92055 La Défense cedex
Email: diffusion.sdes.cgdd@developpement-durable.gouv.fr

www.statistiques.developpement-durable.gouv.fr

MINISTRY OF ECOLOGY TRANSITION AND TERRITORIAL COHESION
Liberté Égalité Fraternité

STATISTIQUE PUBLIQUE