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FAOSTAT ANALYTICAL BRIEF 16

## Pesticides use

Global, regional and country trends

1990–2018

## HIGHLIGHTS

- **Global pesticides use in agriculture remained stable in 2018 with respect to 2017, going from 4.15 million tonnes to 4.12 million tonnes.**
- **Asia is the top contributor to global pesticides use, accounting for more than 50 percent of the world total in 2018.**
- **Herbicides, together with Fungicides and Insecticides, contribute to more than 95 percent of the total pesticides applied in agriculture in the 2010s in countries other than China and India.**
- **Compared to the rest of the world, Europe has the lowest proportion of pesticides derived from insecticides (12 percent).**
- **The top three users of pesticides in 2018 are China (1 774 thousand tonnes), the United States of America (408 thousand tonnes) and Brazil (377 thousand tonnes).**

## FAOSTAT PESTICIDES USE

### BACKGROUND

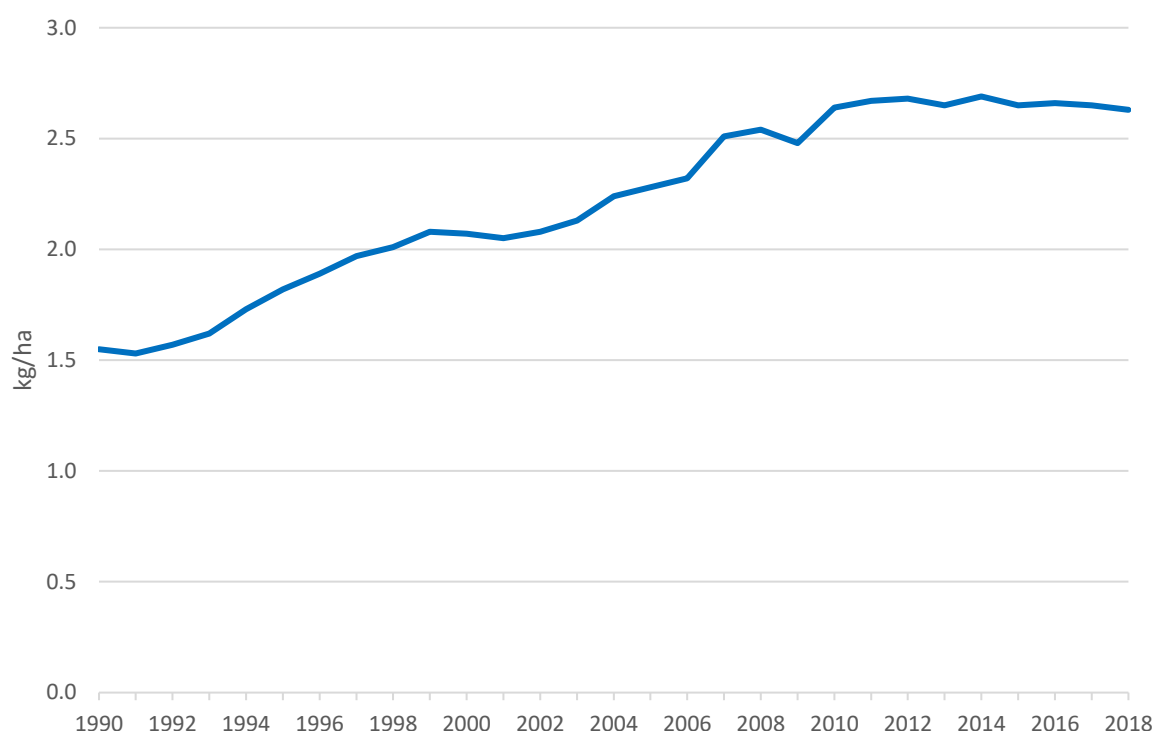
When used responsibly, pesticides are a key agricultural input that can help to protect seeds and safeguard crops from unwanted plants, insects, bacteria, fungi, and rodents. At the same time, pesticides can have negative environmental impacts through contamination of soil, water and non-target plants and animals that can decrease biodiversity and, in some cases, reduce crop yield. Pesticides use in agriculture as an input and the agri-environmental indicator measuring use by cropland area serve to monitor the use of pesticides across the globe as well as at the regional and country levels. These two domains have been updated with figures through 2018.

### GLOBAL

At the global level, total pesticides use in agriculture remained stable in 2018 with respect to 2017, going from 4.15 million tonnes (Mt) to 4.12 Mt. The worldwide application of pesticides per area of cropland declined from 2.65 kg/ha to 2.63 kg/ha from 2017 to 2018.

Figure 1 shows the increasing trend of pesticides use in agriculture per area of cropland. Despite the stability in recent years, total pesticides use increased in the 2010s by more than 50 percent compared to the 1990s, with pesticides use per area of cropland increasing from 1.80 kg/ha to 2.66 kg/ha.

**Figure 1: Global pesticides use per cropland area, 1990–2018**



**Source:** FAOSTAT Pesticides Use and Pesticides Indicators, 2020.

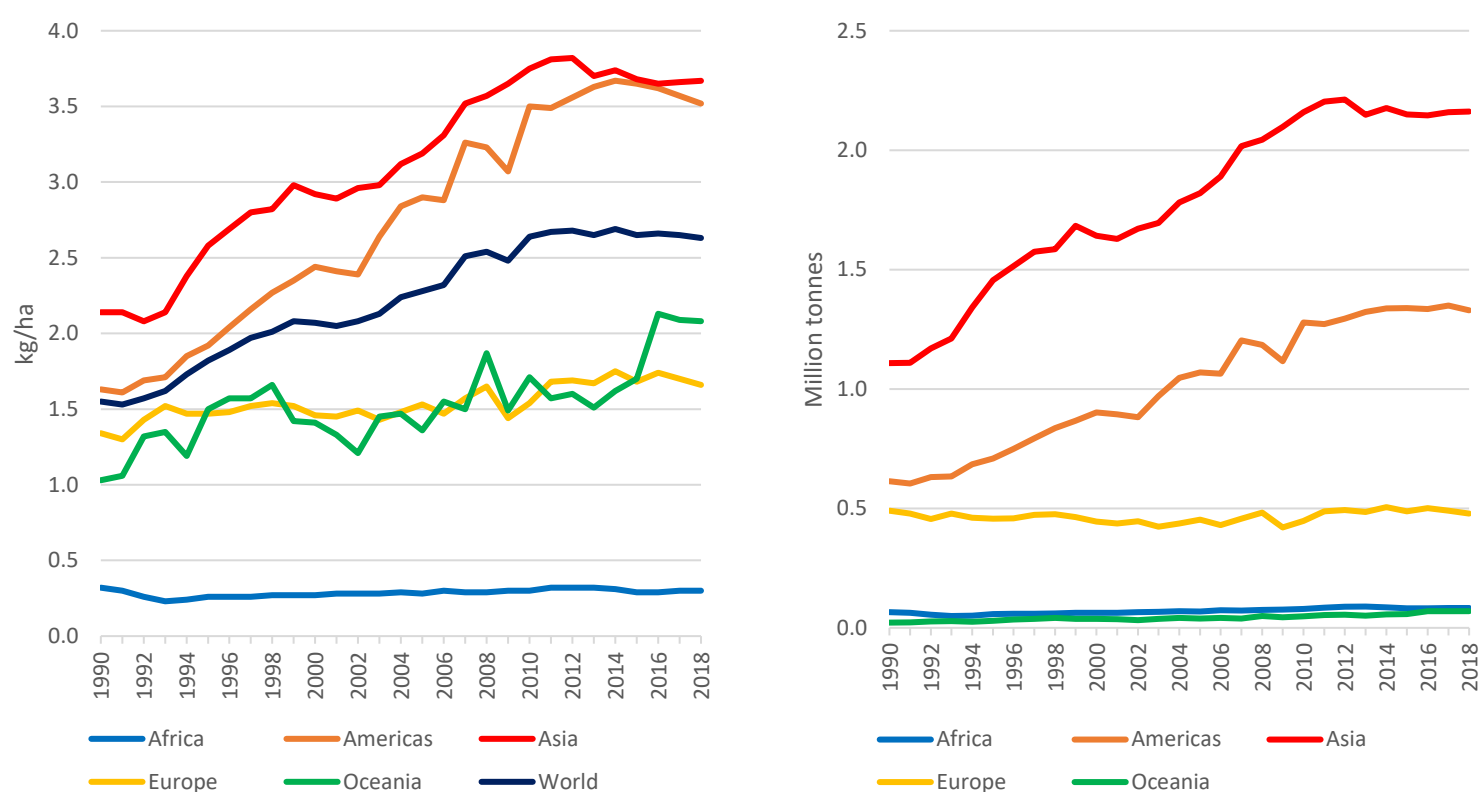
While China and India have incomplete information on pesticides application by type, and are therefore excluded from regional and global aggregates providing this level of detail, some insights can still be derived from an analysis of the group of countries for which the breakdown is available. The application of Herbicides, Fungicides and Bactericides, and Insecticides went up between the 1990s and the 2010s, with increases in the share of total pesticides coming from Herbicides (from 42 percent to 55 percent) and reductions in the shares of Fungicides (26 percent to 23 percent) and Insecticides (24 percent to 17 percent). Herbicides is therefore the predominant type of pesticide used in agriculture outside China and India, accounting for more than half of the total pesticides applied in the 2010s. Herbicides, together with Fungicides and Bactericides, and Insecticides, contribute to more than 95 percent of the total pesticides applied in agriculture during this period. The other main pesticides types (including Mineral Oils, Plant Growth Regulators, Rodenticides, Seed Treatments, and Disinfectants) make up for the remaining 5 percent of total pesticides.

## REGIONAL

Asia is the top contributor to global pesticides use, accounting for more than 50 percent of the world total in 2018. The region applied nearly 2.17 Mt of pesticides to cropland during the 2010s at a mean application rate of nearly 3.72 kg/ha. Excluding China and India, Herbicides, Fungicides and Insecticides were used uniformly with respective shares of 38 percent, 32 percent and 29 percent.



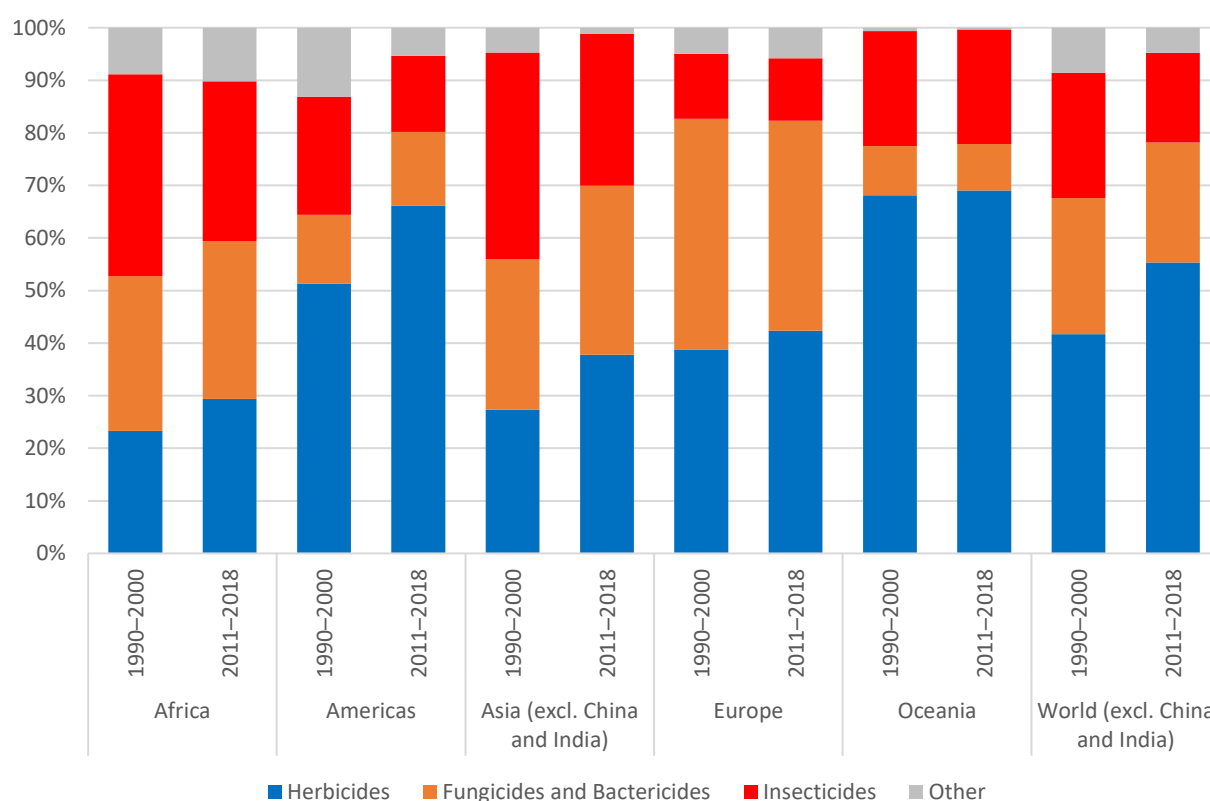
Figure 2: Regional pesticides use per cropland area and absolute amounts, 1990–2018



**Source:** FAOSTAT Pesticides Use and Pesticides Indicators, 2020.

Oceania and the Americas had the highest growth rates in total pesticides use from the 1990s to the 2010s with approximately 1.9- and 1.8-fold increases, respectively. Although Oceania had the highest growth rate of all regions from the 2010s as compared to the 1990s, the region applies the lowest levels, averaging approximately 60 thousand tonnes (kt) of pesticides per year in the 2010s and contributing less than 2 percent to the global total in 2018. Oceania applied 1.79 kg of pesticides per ha in the 2010s as compared to 1.37 kg/ha in the 1990s. The region increased Herbicides use from 21 kt to 41 kt, Fungicides use from 3 kt to 5 kt, and Insecticides use from 7 kt to 13 kt per year over the same period. The Americas had a high growth rate in pesticides use across the two decades and applies high levels of pesticides contributing nearly one-third to the global total in 2018. The Americas applied approximately 3.59 kg of pesticides per hectare of cropland each year in the 2010s, up from a mean application rate of 1.97 kg/ha in the 1990s. The region augmented Herbicides use from 362 kt to 840 kt, Fungicides use from 93 kt to 178 kt, and Insecticides use from 159 kt to 184 kt per year in the most recent decade as compared to the 1990s.

**Figure 3: Regional pesticides shares by category, 1990–2000 and 2011–2018**

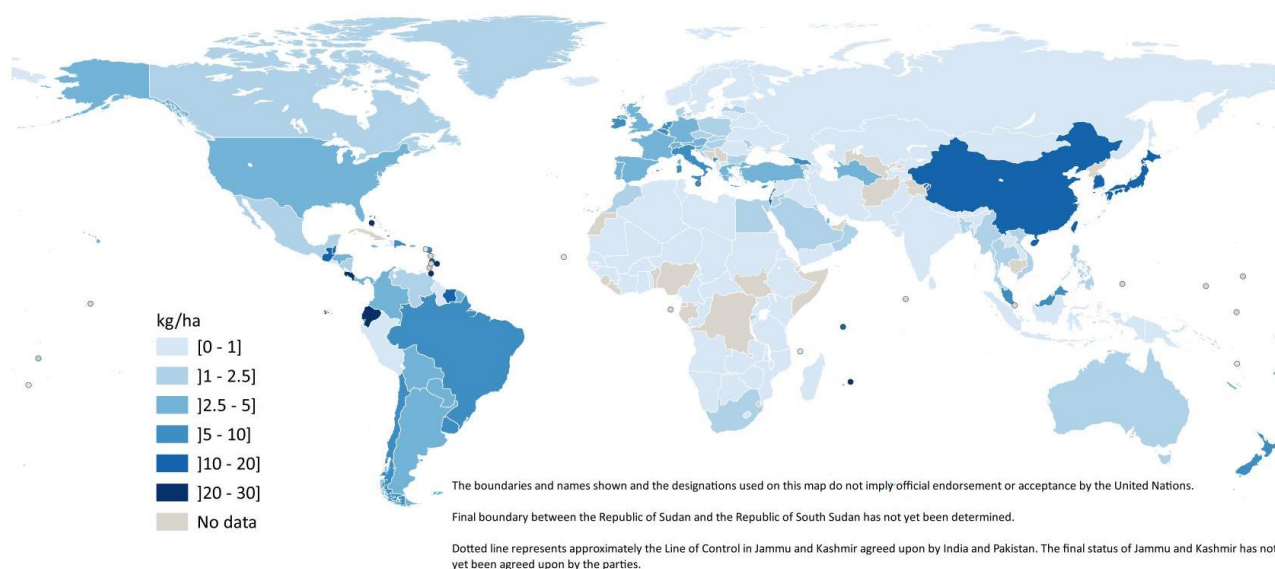


**Source:** FAOSTAT Pesticides Use and Pesticides Indicators, 2020.

Africa and Europe had the slowest growth rates when comparing the 2010s to the 1990s. Africa increased total pesticides use in agriculture by 44 percent across these two periods and maintained low pesticides use per area of cropland averaging just 0.27 kg/ha in the 1990s and 0.31 kg/ha in the 2010s. In 2018, the region contributed just 2 percent to the global share of pesticides use. Africa is the only region with the largest proportion of applied pesticides derived from Insecticides – approximately 30 percent of pesticides used in Africa are Insecticides. Europe increased pesticides use in agriculture in the 2010s as compared to the 1990s by just 5 percent, most likely due to the stringent European Common Agricultural Policy put in place, which monitors and controls the use of pesticides. Compared to the rest of the world, Europe has the lowest proportion of pesticides derived from Insecticides (12 percent). The region's pesticides use per area of cropland is approximately 1.66 kg/ha in 2018.

## COUNTRY

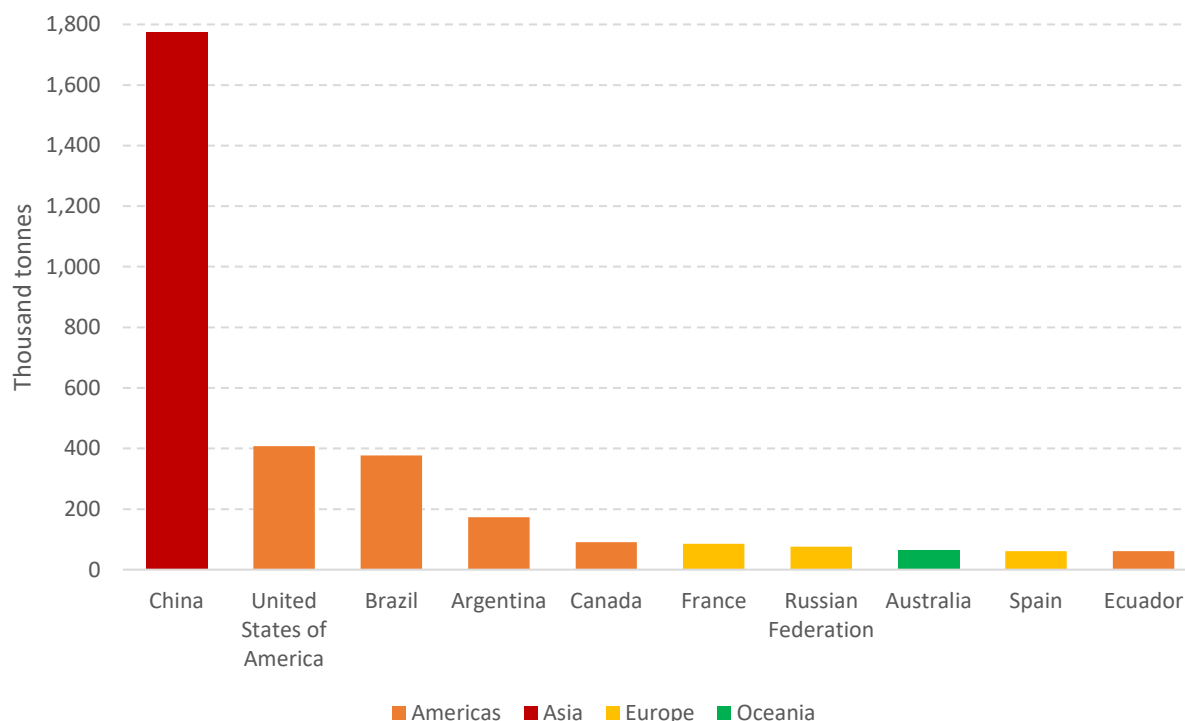
Map 1 shows wide disparities between the pesticides application rates within regions: for example, China, Japan and the Republic of Korea have application rates above 10 kg/ha while nearly all the other Asian countries are below 1 kg/ha. Europe also has a similar divide between the Nordic and Eastern European countries that have low pesticides use per hectare, and the rest of the continent, where pesticides use per hectare is in general more than the world average of 2.6 kg/ha.

**Map 1: Pesticides use per cropland area, 2018**

**Source:** FAOSTAT Pesticides Use and Pesticides Indicators, 2020.

Figure 4 shows that China is by far the largest user of pesticides in 2018, with 1 774 kt of pesticides applications for agricultural use. Next in the top 10 are the United States of America (408 kt), Brazil (377 kt), Argentina (173 kt), Canada (91 kt), France (85 kt), the Russian Federation (76 kt), Australia (63 kt), Spain (61 kt), and Ecuador (61 kt). Out of the top 10 pesticides users, five are in the Americas and six among the top 10 countries in terms of cropland area.

Figure 4: Top 10 countries for total pesticides use in agriculture in 2018



Source: FAOSTAT Pesticides Use and Pesticides Indicators, 2020.

Figure 5 displays the top 10 countries for pesticides use per area of cropland for 2018, which are Mauritius (28 kg/ha), Ecuador (26 kg/ha), Trinidad and Tobago (25 kg/ha), Costa Rica (22 kg/ha), Bahamas (21 kg/ha), Barbados (21 kg/ha), Saint Lucia (20 kg/ha), China (13 kg/ha), Israel (13 kg/ha), and Seychelles (12 kg/ha). Six of these countries are Small Island Developing States. China is also notable for being the largest pesticides user in absolute quantities and among the largest users per hectare of cropland.

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