

EFFECTS OF NON-COMPLIANCE WITH INTELLECTUAL PROPERTY RIGHTS REGARDING PESTICIDES

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Abstract: *In the context of today's society, intellectual property rights are an important source of economic benefits. When the infringement of these rights is done with regard to products or substances that also potentially endanger the environment and human health, research on these infringements becomes imperatively necessary. This paper highlights the dual effect of infringing intellectual property rights in the field of pesticides (both in economic and environmental terms, and on human health) and it draws attention to the need for multidisciplinary research to raise awareness among potential producers and users of such products.*

Key words: *pesticides, Intellectual Property Rights, economic effect, environmental effect*

1. Introduction

The need for this study arose following the publication, in July 2021, by the European Union Intellectual Property Office (EUIPO) along with the Organisation for Economic Co-operation and Development (OECD), of the report *Global Trade in Fakes. A Worrying Threat* which, in addition to emphasizing that “*illicit trade in fake goods is a significant and growing threat in a globalised and innovation-driven economy*”, signals that “*counterfeit chemical products, such as fertilizers or pesticides, may raise environmental issues*” (OECD-EUIPO, 2021, p.3, 22).

Therefore, in this paper we aim to identify, at least from a theoretical point of view, what the possible impact of pesticide counterfeiting on the environment is. The approach starts from the presentation, in legislative terms, of the role and effects of pesticides, being followed by the presentation, from an economic point of view, of the effects of the Intellectual Property Rights (IPR) infringement in the pesticides sector.

The possible impact of pesticide counterfeiting on the environment is presented in the light of the study conducted on the literature regarding the already known negative effects on the environment.

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2. Role and Effects of Pesticides

Pesticides are dangerous chemicals used in agriculture, horticulture, parks and gardens to suppress, eradicate and prevent the emergence and development of organisms considered harmful to them. Pesticides include insecticides, fungicides, herbicides, rodenticides and plant growth regulators (EU Facts sheets, 2021).

The regulation of pesticides is quite strict at the level of the European Union which, since 1991, has built a strong legislative framework for the authorization of plant protection products, the promotion of their sustainable use and the reduction of their risk to human health and the environment (Special Report, 2020, p.6). Whereas pesticides, as plant protection products, can have not only a positive impact by increasing agricultural yields, but also a negative impact on water and soil quality, biodiversity and ecosystems and can be found as food residues, there are a number of regulations at EU level on these issues.

At this time, there are both general regulations on hazardous chemicals (Regulation REACH; Regulation, 2012), and special regulations on:

- pesticide production (Regulation, 2021e; Regulation, 2011);
- pesticide use (Directive 2009) and control of their use (Regulation 2021d; Regulation 2021a; Regulation, 2020);
- pesticide residues in food (Regulation 2005; Regulation 2021b; Regulation 2021c),
- pesticide residues in plants (Regulation 2021f), animals, water and soil (Decision, 2005; Decision, 2019).

The study of these regulations shows that, from the moment of the request for the production of such chemicals, up to the possible negative side effects of the use of these products, both the protection of consumers in terms of their health and the protection of the environment, mainly water and soil protection, are taken into account.

3. Effects of Infringement of Intellectual Property Rights in the Pesticide Sector

Intellectual assets play an important role in economic growth. It is stated that *“intangible assets, such as inventions, artistic and cultural creations, brands, software, know-how, business processes and data, are the cornerstones of today’s economy”* (Communication, 2020). We can say, in general, that intellectual property is a key factor and facilitator of success for industry and especially for modern industries (Salcă-Rotaru, 2018, p.40). Policies to improve trade facilitation and globalization have also had an effect on intellectual assets and therefore on economic growth.

In the current international economic context, the growing importance of intellectual property has created new opportunities for criminal networks, which speculate, based on other people’s intellectual assets, with counterfeits. In a recent OECD and EUIPO report on illicit trade, it is emphasized that *“the recently observed broadening scope and magnitude of counterfeiting, in particular in the context of trade, is seen as a significant economic threat that undermines innovation and hampers economic growth”* (OECD & EUIPO, 2021, p.11).

But it is not only the economic effects that can be considered worrying. Possible direct negative effects on agricultural products and indirect effects on the food source (plant and animal) as well as on the soil and water source should be considered (Mourato & all., 2000; Pretty & Hine, 2012; Stephenson & et al., 2001).

3.1. Economic Effects

The category of pesticide fraud includes three broad subcategories: fakes, counterfeits and illegal parallel imports. In recent years, joint action by various national and European authorities and agencies has shown the extent of these frauds. A recent example is Europol's coordination of the sixth edition of operation Silver Axe targeting the trade in counterfeit and illegal pesticides, conducted between 13 January and 25 April 2021. The joint action involved law enforcement authorities from 35 countries (all 27 EU Member States and 8 third party countries). The global operation was supported by the European Union Intellectual Property Office (EUIPO), the European Anti-Fraud Office (OLAF), the European Commission's DG SANTE, the European Crop Protection Association (ECPA) and CropLife Europe (Press Release, 2021).

For any operator, economic agent who is active on the national market, but especially on the international one, intellectual property *"is a key asset to be able to compete globally"* (Communication, 2020). It was estimated by OECD and EUIPO for 2019 that worldwide, 2.5% of world trade is trade in counterfeit and pirated goods, and at the level of imports in the EU alone, 5.8% thereof are counterfeit goods. (OECD & EUIPO, 2021, p.3)

The literature (Shattuk, 2021) notes a structural transformation in the pesticide industry caused by reduced innovation, increased regulatory costs, China's role in this field (and not only) that have changed prices, supply chains and formulations; hence it was estimated that *"the legitimate industry loses approximately EUR 1.3 billion of revenue annually due to the presence of counterfeit pesticides in the EU marketplace, corresponding to 13.8 % of the sector's sales"* (EUIPO, 2017, p.5). It can be stated, based on the importance given at the level of the EU and OECD countries, the economies of which are based on innovation and creativity, that most infringements of intellectual property rights occur against the economic agents of these states. In this regard, the source of counterfeit products is also relevant, which places China and Hong Kong (China) as the top 2 countries in terms of source of counterfeit products, being followed, at least in the period 2016-2019, by Turkey (Figure 1).

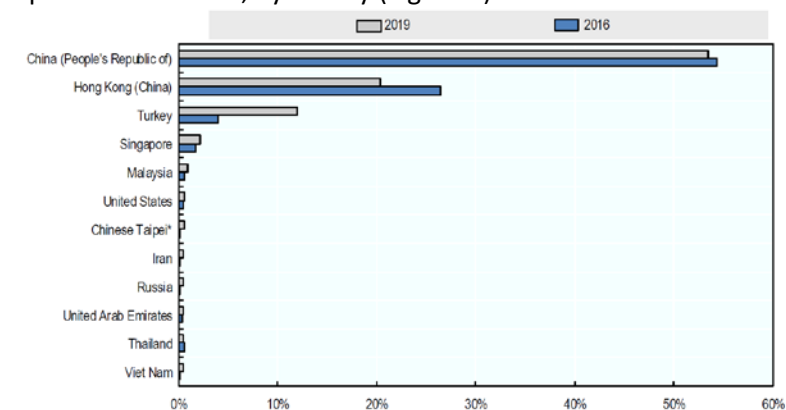


Fig. 1. *Differences in provenance economies in counterfeit and pirated trade, 2017-19*

Source: OECD & EUIPO, 2021, p.20

For a clearer view of the amount of pesticides used, by conducting research on the statistical data held by the Food and Agriculture Organization (FAO, www.fao.org) on the amount of pesticides used globally and by region, we have found that in 2019, as compared to 1990, the known amount (these being purchased from declared and verified sources) of pesticides used, is double (Figure 1).

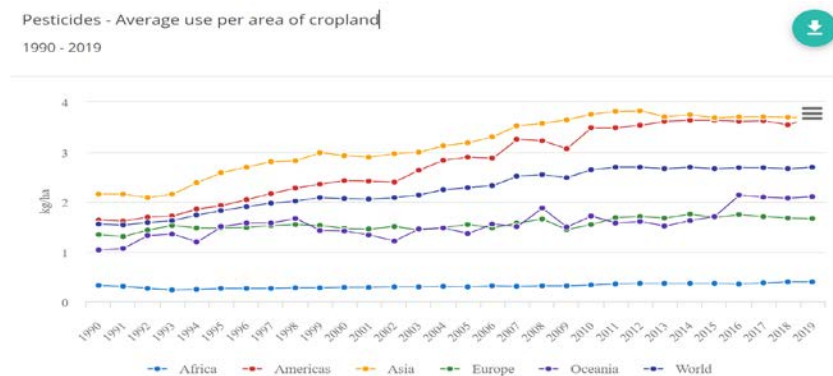


Fig. 2. Amount of pesticides used globally and by region, in the period 1990-2019

Data Source: www.fao.org

Garth Drury stated in 2014, in his capacity as Head of Global Regulatory & Government Affairs at Rotam, and President of the European Crop Care Association (ECCA), that “the overall global estimation, based on ECCA’s data (www.illegalpesticides.eu), is that up to 15% of the crop protection products in the open market of unknown provenance are fake (in Europe ECCA cites this as somewhere between 710%). Globally, this loss is equivalent to a single company with sales in the region of US\$4 billion and a top 5 ranking in the industry” (Drury, 2014).

The European Court of Auditors’ 2020 special report shows that in the EU, sales of active substances used in plant protection products exceed 350 000 tonnes per year (Special Report, 2020, p.4).

All these data reveal the economic importance of pesticide counterfeiting.

3.2. Environmental Effects

The effects on the environment are given by their classification according to the degree of dangerousness (Kaur et al., 2019) and the way of counterfeiting these products. Reality has shown that “fake pesticides are often sold in simple packs without label information or with minimal labelling about their use and precautions” (Kassem & et al., 2021). We agree with the definition given for counterfeit and fake pesticides, as “illegal copies of a branded, legitimate pesticide. Counterfeit pesticides are characterised by high-quality fake branding and packaging, and may therefore be difficult to distinguish from a legal product. In contrast, fake pesticides can be more easily identified due to their poor quality and packaging” (OECD, 2018; Frezal, & Garsous, 2020).

The quality of the pesticides sold in this way can be questioned because:

- either they do not contain the active substances necessary for the desired effect, but they are not harmful to the environment - may contain anything from water or talc (Fishel, 2009);

- have a low efficiency because they either contain the active substances in a dilute concentration or their quality or concentration is poor,

- or they contain prohibited or restricted substances.

Pesticides can be natural compounds, or they can be synthetically produced (Mahmood & al., 2016). The object of counterfeiting is, as a rule, pesticides obtained synthetically.

It is generally recognized that pesticides have not only positive effects, but also a whole series of negative effects. They adversely affect species that are not specifically subject to pesticide treatment (IPBES, 2016) and, by bioaccumulation, also affect animals. Pesticides also reach the aquatic environment from the soil or plants (Riah et al., 2014). Therefore, the negative effects extend both to biodiversity (Geiger et al., 2010; Brühl & Zaller, 2019) and to aquatic (Holden, 1972; Dunier & Siwicki, 1993; Khan & Law, 2005) as well as terrestrial food webs and ecosystems (Pimentel & Edwards, 1982; Sánchez-Bayo, 2011; Hough, 2021). Another negative aspect is developing resistance to active pesticide products (Le Goff & Giraudo, 2019).

Starting from the quantities of pesticides used in the countries with the highest amount of pesticides / agricultural land (Figure 3) and from the trend of increased reuse of pesticides in the EU as well (Figure 4), and corroborating this information with the model of pressure of pesticides on the environment (Figure 5) and with the explanation of the bioaccumulation of pesticides (Figure 6), it undoubtedly follows that the issue of counterfeits pesticides is a complex one.

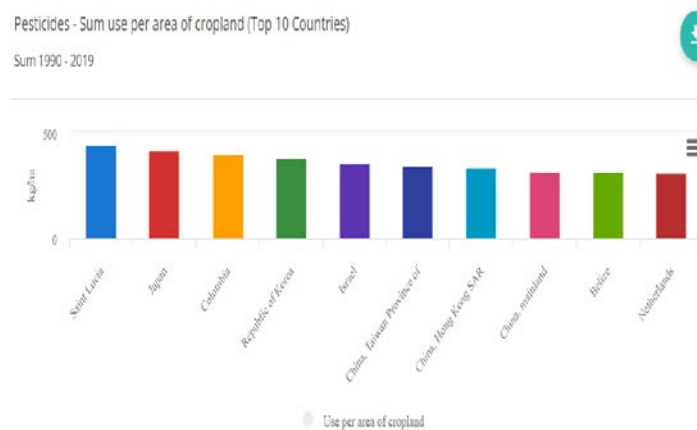


Fig.3. *Top 10 countries with the highest amount of pesticides used / area*

Data Source: <https://www.fao.org/>

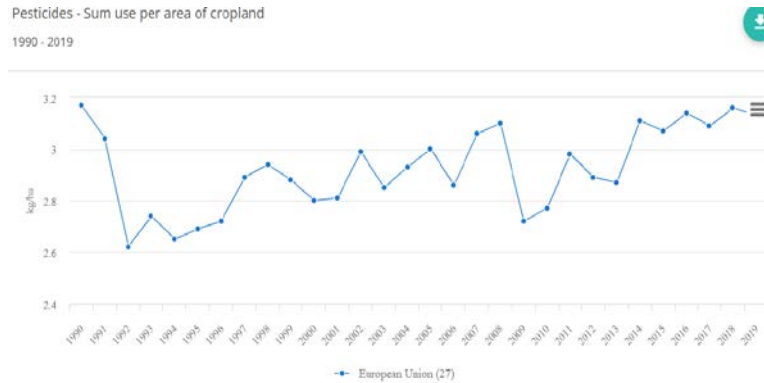


Fig. 4. Graph of pesticide use in the EU (1990-2019)

Data Source: <https://www.fao.org/>

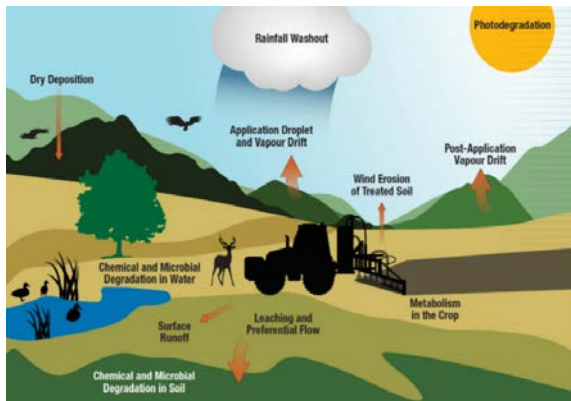


Fig. 5. Model of pressure of pesticides on the environment

Source: Clearwater et. al, 2016, p.155

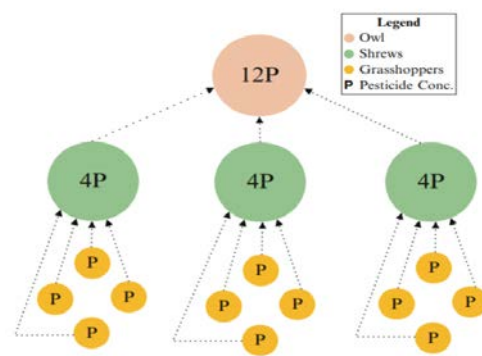


Fig. 6. Model of pesticide bioaccumulation

Source: Mahmood et al, 2016, p.260

The multidisciplinary approach thus becomes a must, not only in the light of environment-human health, but also in that of economic-environment and human health.

4. Conclusions

Society is aware that counterfeits can be found among many types of tangible goods, that counterfeiting threatens a large number of industries and that they have a negative effect on both personal and state economies. Periods of recession can be characterized by the finding and use of methods to ensure material benefits, in breach of the rules of law. One of these methods is the infringement of intellectual property rights, by both producers and consumers.

If, in some of the fields in which such methods are used, they have a negative effect only financially (common consumer products like clothing, footwear or luxury items, like fashion apparel, deluxe watches), in others, the negative effect is also on the environment and most often on human health (fake pesticides or other chemicals, fake pharmaceuticals or cosmetics).

Most research shows the effect of pesticide use on the environment and human health in relation to legally produced pesticides. Regarding pesticide counterfeiting, the studies focus on the financial aspect.

This paper, by simultaneously presenting the two research directions (financial-economic, and environmental and health), although it does not seek to bring solutions to combat the use of the pesticides produced and used in non-compliance with IPR, proposes the more detailed presentation of the relationship of non-compliance with IPR - economic effects - environmental and health effects as a research topic to be subsequently developed.

We dare say this new approach is necessary because there is a need to raise awareness and / or emphasize the beneficial link between legally produced and marketed pesticides, IPR compliance and economic and environmental benefits, in contrast to the false gains from the use of counterfeit pesticides.

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