

Knowing *Robotox*: A profile of monitoring and releasing pesticides in Brazil

Conhecendo *Robotox*: Um perfil de monitoramento e liberação de agrotóxicos no Brasil

Conociendo a *Robotox*: Un perfil de monitoreo y liberación de agrotóxicos en Brasil

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Abstract

Pesticides are products intended for the production sector, whose purpose is to preserve ecosystems by altering the composition of flora or fauna in order to preserve them from the harmful action of living beings considered harmful. The insertion of pesticides in Brazil is due to the Green Revolution, the mechanization and the intense use of agricultural inputs. As a result, damage to workers' health and the environment has been observed. *Objective*: To present the @robotox profile as a monitoring tool in the release of new pesticides. *Methodology*: From the exploratory research, the path was divided into 1) analyzing the profile systematically and 2) correlating with filtered data from MAPA (Ministry of Agriculture, Livestock and Supply)/ANVISA (National Agency for Health Surveillance), both steps with temporal descriptors. Furthermore, the *results*: establish that the @robotox profile is an interdisciplinary initiative that dialogues between the social and scientific fields. It explores information condensed in the media in real-time, favoring the debate about agroecology in Brazil and the increase in pesticide releases that were made possible mainly due to political ruptures, increase in conservation capital, annulment of already sanctioned fundamental rights and technical neutrality.

Keywords: Robotox; Agrotoxics; Agroindustry; Environment; Human health.

Resumo

Agrotóxicos são produtos destinados ao setor de produção, cuja finalidade é a preservação de ecossistemas alterando a composição da flora ou da fauna, a fim de preservá-las da ação danosa de seres vivos considerados nocivos. A inserção de agrotóxicos no Brasil deve-se à *Revolução Verde*, ou seja, a mecanização e o uso intenso de insumos agrícolas, em consequência, tem sido observado danos causados à saúde dos trabalhadores e meio ambiente. *Objetivo*: Apresentar o perfil @robotox, como uma ferramenta de monitoramento na liberação de novos agrotóxicos. *Metodologia*: A partir da pesquisa exploratória, o trajeto foi dividido em 1) analisar de forma sistêmica do perfil e 2) correlacionar com dados filtrados da MAPA (Ministério da Agricultura, Pecuária e Abastecimento)/ANVISA (Agência Nacional de Vigilância Sanitária) ambos os passos com descritores temporais. E os *resultados*: estabelecem

que o perfil @robotox é uma iniciativa interdisciplinar que dialoga entre o campo social e científico, pois, explora informações condensadas nas mídias em tempo real favorecendo o debate acerca da agroecologia no Brasil e o aumento das liberações de agrotóxicos foram viabilizados principalmente por rupturas políticas, incremento do capital conservacionista, anulação de direitos fundamentais já sancionados e neutralidade técnica.

Palavras-chave: Robotox; Agrotóxicos; Agroindústria; Meio Ambiente; Saúde humana.

Resumen

Agrotóxicos son productos destinados al sector de producción, cuya finalidad es la preservación de ecosistemas alterando la composición de la flora o de la fauna, a fin de preservarlas de la acción dañina de seres vivos considerados nocivos. La inserción de agrotóxicos en Brasil se debe a la Revolución Verde, o sea, la mecanización y el uso intenso de insumos agrícolas, en consecuencia, se ha observado daños causados a la salud de los trabajadores y medio ambiente. *Objetivo:* Presentar el perfil @robotox, como una herramienta de monitoreo en la liberación de nuevos agrotóxicos. *Metodología:* A partir de la investigación exploratoria, el trayecto fue dividido en 1) analizar de forma sistémica el perfil y 2) correlacionar con datos filtrados del MAPA (Ministerio de Agricultura, Ganadería y Abastecimiento)/ANVISA (Agencia Nacional de Vigilancia Sanitaria) ambos pasos con descriptores temporales. Y los *resultados:* establecen que el perfil @robotox es una iniciativa interdisciplinaria que dialoga entre el campo social y científico, pues, explora informaciones condensadas en los medios de comunicación en tiempo real favoreciendo el debate acerca de la agroecología en Brasil y el aumento de las liberaciones de agrotóxicos fueron viabilizados principalmente por rupturas políticas, incremento del capital conservacionista, anulación de derechos fundamentales ya sancionados y neutralidad técnica.

Palabras clave: Robotox; Agrotóxicos; Agroindustria; Medio Ambiente; Salud humana.

1. Introduction

The popularization, commercialization, and distribution of pesticides on the world stage began in the middle of the Second World War with the discovery of the organochlorine insecticide DDT (Dichloro-Diphenyl-Trichloroethane), becoming public due to its low cost and effectiveness (Salomão et al., 2020).

In Brazil, the development of agroindustry was made possible by the process called Green Revolution, characterized by the following factors: 1) Political flexibility and media contextualization, 2) Mechanization of production techniques and insertion of transgenic seeds, 3) High dependence on chemical inputs (Franco & Pelaez, 2016; De Souza et al., 2020).

Ramos et al. (2018) propose that this perspective is related to the increase in the production of commodities which, through excessive supply to the world market, it causes an imbalance in prices, inducing the state to a crisis in agriculture, so the capitalization and development of some causes crisis in other farmers.

Another subtopic inherent to the implementation of pesticides in Brazil was the insertion of rural credit concession programs, including 1) The creation of the National Rural Credit System (SNCR, Law nº 4.595/1964), responsible for financing rural producers and 2) National Agricultural Defensive Program (PNDA) created through the National Development Program (PND) provided entry and installations of foreign companies in the country. These political maneuvers were justified due to the country's investments and the search for the agribusiness revolution, and consequently, the multinationals took advantage of these maneuvers to operate in Brazil (Costa & Pires, 2016).

1.1 Pesticides: General concepts

The adoption of the terms agrottoxics, pesticides, and agricultural defensives, among others, is marked by the opposition. In this aspect, it is necessary to delimit the synonyms and their respective meanings, Table 1.

Table 1. Meanings of the synonyms of agrottoxics.

| Synonyms | Meanings |
|-------------------------|--|
| Pesticides | Refers to what "kills pestilence" |
| Agricultural defensives | "It is the literary device to disguise the harmful nature of these products" |

Source: Authors (Souza; Belaidi, 2016).

According to Aguiar et al., (2019) the term pesticide is not suitable for the technical-scientific view since it is known that these substances cause the death of organisms and microorganisms that are not harmful. Therefore, they cannot be called by this term. Although, in the literature, using the expression pesticide does not make reality feasible, as it is not the treatment of “plague”, a contagious, epidemic and severe disease. However, the use of the agricultural defensive word is called a poisonous chemical product used in the agroindustry that has destructive effects on the balance of the ecosystem.

From Law No. 7,802/1989 (art. 2, item I) in accordance with Decree No. 4,074/2002 (art. 2, item III), pesticides are defined as:

They are products and/or agents of physical, chemical or biological processes intended for use in the production sectors, in the storage and processing of agricultural products, in pastures, in the protection of forests, native or implanted, and of other ecosystems and also of environments. urban, water and industrial areas, whose purpose is to change the composition of flora or fauna in order to preserve them from the harmful action of living beings considered harmful, as well as substances and products used as defoliant, desiccants, stimulators, and growth inhibitors (Planalto, 1989).

Because of this, it is observed that the choice of the term used to designate chemical agents as an object of study may seem to be a possible alternative. However, based on the rigor of theoretical studies, it is investigated that this contextualization varies many times depending on the speech, environment, ideological and related objectives, as pointed out in their studies by Souza and Belaidi (2016). Therefore, pesticides are the best expression that fits the present study and contradicts the others mentioned.

Pesticides can be divided into two categories: 1) Agricultural: Intended for use in the sectors of production, processing and storage of products such as in forests, plants and pastures, whose records are approved by the Ministry of Agriculture, Livestock and Supply (MAPA) in compliance with the guidelines and requirements of the Ministries of Health and Environment and 2) Non-Agricultural: Aimed at use in industrial and urban, collective or public environments, in public health campaigns and water treatment, its registration is established by the Ministry of Health/ANVISA (National Agency for Health Surveillance) in compliance with the guidelines and requirements of the Ministries of Health and Environment as mentioned (Salomão et al. 2020).

As for the classification by purpose, that is, the function of the chemical in which the active ingredient acts on specific targets such as Herbicides (weeds), insecticides (insects), fungicides (fungi), nematicides (nematodes), molluscs (molluscs), acaricides (mites), rodenticides (rodents), growth regulators and inhibitors (Terra & Pelaez, 2008).

From the present Brazilian agro-industrial scenario, this study aims to investigate the @robotox profile as a pesticide monitoring tool using the 2019-2020 cut-off and correlate with filtered data from MAPA (Ministry of Agriculture, Livestock and Supply) / ANVISA(National Agency for Health Surveillance) with a cut-off between 2015-2020.

1.2 Risks to human and environmental health

Despite advances in laboratory technologies, which have allowed the evaluation of food quality on Brazilian tables. However, the use of pesticides was driven by man's desire for better living conditions. Consequently, the extensive use of these inputs causes an imbalance in the health of workers and adjacent populations in agricultural areas and the environmental spectrum (Borsoi et al., 2015).

According to Carneiro et al., (2015) and Barbosa et al., (2020), pesticides can be absorbed by different routes such as: oral, dermal and respiratory. Once in the human body, it can cause acute (exposure to toxicants for short periods) and chronic (exposure to toxicants for long periods) intoxications (Soares, 2010). The main symptoms of acute effects are vomiting,

headache, nausea, dizziness, paraesthesia, disorientation, hyperexcitability, muscle fasciculation, skin and mucous membrane irritation, hemorrhage, difficulty breathing, convulsions and/or death. Furthermore, the chronic effects include congenital malformations, genetic and immunological alterations, neoplasms, neurobehavioral effects, infertility, endocrine, hepatic, and reproductive disorders (Silva et al., 2005; Silva et al., 2021).

In their studies, Borsoi et al., (2015) portray that the physicochemical properties of pesticides, biotic and abiotic characteristics of the ecosystem (water, biota, soil, among others), meteorological conditions as well as the amount and frequency of use may determine the route of pesticides in the environment. Thus, these processes can predict the behavior and interaction with the evaporation rate, water-solubility, soil particles, and bioaccumulation, among other characteristics of the components.

In addition, the effects of pesticides in aquatic environments can interfere with the physiology, reproduction, and behavior of organisms; in terrestrial environments, they interfere with nutrient cycling, soil respiration, bird and/or fish mortality, and the reduction of their populations. (Tavella et al., 2012).

Other factors aggravating the effects of pesticides on ecosystems occur through 1) percolation through the soil profile, leading to groundwater contamination, 2) agricultural practices linked to agribusiness, the non-preservation of riparian forests and forms of vegetation that protect springs, the destruction of the vegetation cover of the soil for planting, among other factors, are responsible for a large part of the problems with water resources 3) Pesticides in the form of particulate matter suspended in an aquatic environment, accumulate in the bottom sediment or be absorbed by organisms, and can then be accumulated or detoxified. They can be transported through the aquatic system by diffusion in water currents or in the bodies of aquatic organisms in which pesticide metabolites can return to the atmosphere through volatilization. Thus, showing a continuous interaction of pesticides between sediment and water, induced by turbulence, water movement and temperature. A longer exposure time of aquatic organisms to toxic compounds may result from these vectors (Dos Santos; Da Silva, 2007; Botelho et al., 2020).

2. Theoretical Reference

2.1 Agribusiness x Family Farming

Contextualizations and interpretations can be redefined from the use and treatment/definition of identical terms. On the other hand, different terms can be analyzed in analogous ways when used by intellectuals and/or researchers (Da Silva; Breitenbach, 2013). In this context, the terms agribusiness and family farming are conflict-generating concepts, and it is intended to discuss the concepts in this topic to demystify the inconsistencies of both definitions, that is, proposing the coexistence of the terms in Brazil (De Araújo Soares et al., 2021).

Still, in their studies, Da Silva and Breitenbach (2013) describe family farming as an organized social group of agriculture that exercises a form of production in which the family controls the core of management, decisions, work and capital. That is, it is a production model in which the family plays the role of the owner of the means of production and executor of productive activities (Rambo et al., 2016; Kotz et al., 2021).

In this context, from the law nº 11.326/2006, art. 3 and § 2, a family farmer and family entrepreneur are considered to practice activities in the environment, simultaneously meeting the following requirements:

- I - Do not hold, under any circumstances, an area larger than 4 (four) fiscal modules.
- II - Use predominantly family labor in the economic activities of your establishment or enterprise.
- III - Have family income predominantly originated from economic activities linked to the establishment or enterprise itself.
- IV - Have a minimum percentage of family income originating from the economic activities of your establishment or enterprise, as defined by the Executive Power.
- V - Run your establishment or enterprise with your family.

The following are also beneficiaries of this law: I - Foresters who simultaneously meet all the requirements mentioned in the caput of this article, cultivate native or exotic forests and promote the sustainable management of those environments. II - Aquaculture farmers who simultaneously meet all the requirements mentioned in the caput of this article and explore water reservoirs with a total surface of up to 2ha (two hectares) or occupy up to 500m³ (five hundred cubic meters) of water, when the exploitation takes place in ponds -network. III - Extractivists who simultaneously meet the requirements set out in items II, III and IV of the caputs of this article and carry out this activity by hand in rural areas, excluding prospectors and spark collectors. IV - Fishermen who simultaneously meet the requirements set out in items I, II, III and IV of the caput of this article and carry out artisanal fishing activities. V - Indigenous peoples who simultaneously meet the requirements set out in items II, III and IV of the caput of art. 3rd. VI - Members of the remaining communities of rural quilombos and other traditional peoples and communities that simultaneously comply with items II, III and IV of the caput of art. 3rd (Planalto, 2006).

Still, in the legislative sphere, with emphasis on the diversity of realities in agriculture, there is the contribution of the Ministry of Agrarian Development (MDA, 2000), which differentiates farmers into three categories: a) those inserted in the field of economic activities integrated with the market, b) to the undercapitalized and/or transition, but with some production destined for the market and c) agricultural wage earners, residing in rural and non-agricultural scope with agricultural production focused almost exclusively on self-consumption.

Thus, it is emphasized that the term family farming can assume a generic character, as it has an intrinsic correlation to the peasantry. In summary, the peasantry has as its main characteristic the traditional and/or widespread knowledge in which this “own culture” refers to a tradition, inheritance from past generations and local ways of life, inspiration, among others. In other words, the peasantry is a class that manifests itself with a political perspective and the fight against agribusiness, where the terms land, work and family are guiding points for this definition, representing through networks of associative and cooperative the capacity for production and resistance. of the workers (Caridá, 2012; Schmitz & Mota, 2006; Silva & Mendonça, 2012).

Altafin (2007) emphasizes that family farmers are transforming agents aimed at a sustainable economy in which they assume the role of protectors of landscapes and conservation of biodiversity. At the same time, they produce and make their products viable (Gomes, 2005).

However, agribusiness is conceptualized as the result of a process that involves the production, storage and distribution of items produced from agricultural products. In other words, agriculture represents a significant part of a network of the interaction of economic sectors from production to the distribution of agricultural inputs, as pointed out by Da Silva and Breitenbach (2013) in their studies.

Agribusiness changes the city/country relationship, which initially, the urban space was a consumer of products grown in rural areas. However, from the agricultural mechanization, there is an inversion, where the rural becomes a consumer of the urban, a fact that does not only refers to the insertion of new techniques but in the behavior provoked by the so-called modern characteristics, mainly by the occurrence of a technical basis through the intensive occupation of machinery and inputs, that is, a technical-mechanical process of farming (Karnopp et al., 2012).

According to Caridá (2012) agribusiness is an agro-industrial system whose purpose is to modify a biological process for maximum economic productivity. In which agriculture resembles an industry, and such process is controlled by human action, presenting as main characteristics: commercialization of production, a growing transformation of social relations of production and capital (labor as a commodity), technification of production, use of industrial inputs, production system specialization and product marketing.

This model of agricultural modernization is characterized as conservative, excluding and painful. Conservative: causes stagnation in land structural changes, making land ownership more restricted; Excluding: the workforce (the worker) makes their workforce available in exchange for a salary. However, workers do not have sanitary working conditions, as well

as they cannot interfere in decisions, in the same way as large companies and Painful: the concentration and distribution of wealth remains in small groups causing inequalities (Araújo; Oliveira, 2017). Moreover, in social terms, agribusiness enables the growing increase in economic concentration and land, causes the employment of slave labor, unemployment, increases and feeds land grabbing, and social inequality, among others (Souza & Dos Santos, 2013).

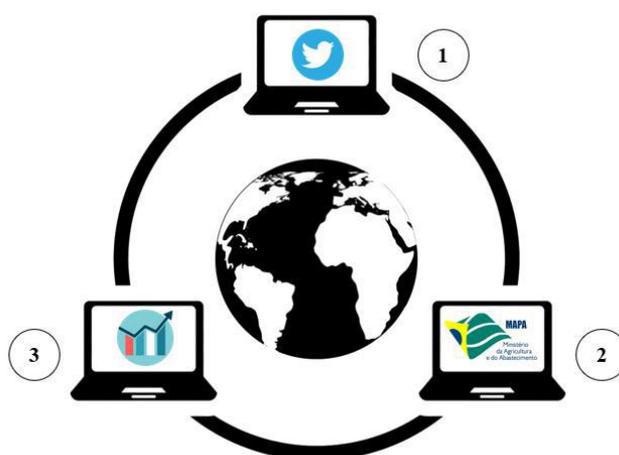
Still, in her studies, Caridá (2012) summarizes the terms family agriculture and agribusiness, stating that family agriculture is the transmission of traditional knowledge aimed at ecological preservation/conservation and not labor exploitation. In contrast, agribusiness represents the technical mechanization of monocultures, exports, rural exodus, the concentration of income and power, social inequality, and ecological and human health imbalance on a labor scale and adjacent populations.

3. Methodology

This work is an exploratory research of qualitative character whose purpose is to analyze data and development of research hypotheses allowing greater objectivity of the research itself and correlating it with the reality (Piovesan; Temporini, 1995).

Through exploratory and qualitative methods, literary research stands out, which includes: 1) Free and practical data access to obtain information (scientific articles, books, ebooks, among others) and 2) Trade literature: access to information available to the general public, applied in the present study (laws, and public profiles, among others.) (Gil, 2002). In summary, figure 1 summarizes the practical steps of the methodology.

Figure 1. Methodology steps.



Source: Elaborated by the authors.

Step 1) corresponds to the visit and knowledge of the publications, numbers of followers, bodies responsible for the publications of the Twitter profile *@robotox* using 2019-2020 as a time frame due to political events and it should be noted that the published information was filtered until July 1, 2021; 2) analyze the accuracy of the profile publications to the available data from pesticide records in MAPA (Ministry of Agriculture, Livestock and Supply)/ANVISA (National Agency for Health Surveillance), expanding the time range to 2015-2020 and 3) relate the data at a quantitative level found to promote the results and their discussion.

4. Results

4.1 Knowing *Robotox*

It is known that the Brazilian agro-industrial model is based on the implementation of pesticides and transgenic foods and considering their harmful effects on human and environmental health. Therefore, it is relevant for the society that scientists follow the approval records of new pesticides in Brazil. This monitoring becomes more relevant due to the political flexibility that dominates the interests of agribusiness in the face of an intense ruralist caucus that boosts business in the sectors, including the pesticide industries (Lima; De Oliveira, 2020).

In line with the general objectives, the cut between 2015 and 2020 was used to exemplify the amount of approved pesticides, data filtered by ANVISA (National Agency for Health Surveillance) and another analysis from 2019 and 2020 using data from *@robotox*.

Robotox is a robot that posts twitters of all pesticide releases carried out by the federal government. Its premise was based on the “Behind Food” project and was implemented through partnerships between Repórter Brasil and Agência Pública. The robotox profile was launched in April 2019 due to the release of pesticides in the country. Data published in the Official Gazette (D.O.U) indicate that it had already approved the release of 166 new records between January and May, of which 48 are classified as highly toxic.

However, the profile represents a robot with a protective mask and a plant on its crest, alluding to the harmful effects of pesticides involving humans and the environment, as shown in Figure 2.

Figure 2. Interface of the *@robotox* profile.



Source: Elaborated by the authors.

Also, according to Figure 2, other relevant information is observed, such as the profile's name that can also be accessed through the link (<https://twitter.com/orobotax?s=08>), the link to the project “behind the food” or which the profile originated and the number of followers. In addition, it presents a fixed description for new followers to understand the purpose of the profile, pronouncing: “Hi! I am robotox, and I was created to keep you up to date with all the new pesticide products that

are released on the Brazilian market” (Texto do Twitter, 2019). The primary purpose of the @robotox profile is political transparency so that the debate takes place at a social level on the Brazilian agricultural issue.

In their contributions, the @robotox profile through the Official Gazette (D.O.U) informs the number of pesticides released, degree of toxicity, crops indicated for consumption, product name and manufacturing companies. In addition, the robot has daily posts, and when there are no new approvals, there is a repetition of data published in the profile, reporting updated counts of pesticides approved since 2019 and how many are used throughout Brazilian territory, Figure 3.

Figure 3. @robotox publishing information and planning.



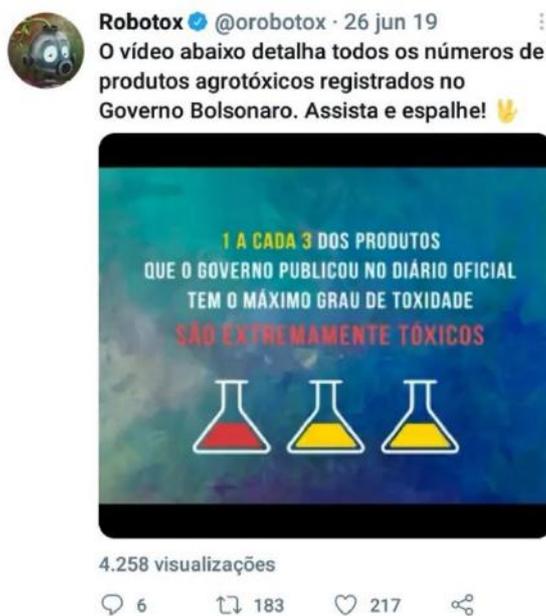
Source: Elaborated by the authors.

It should be noted that the profile consists of 2,853 published tweets. Based on the analysis of fig. 3, it is highlighted that currently, 3325 pesticide products are marketed in Brazil, with the approval of 1259 were approved by the present government.

However, Lima and De Oliveira (2020) describe that the pace of approval of pesticides continues to accelerate. For example, in 2021 January of the same, 88 new pesticides were already released, accounting for 998 new products approved by the current government.

As mentioned, @robotox posts aim to count new pesticides and other relevant information. However, other news can be mentioned through retweets (reproduction of a post from another profile) or own posts, but always correlating the retweeted news to the scope of the robot profile, as shown in Figure 4.

Figure 4. Other news available on @robotox.



Source: Elaborated by the authors.

The profile's popularity fostered interactions with public figures such as Marcelo Adnet, which such figures produce digital engagement and/or work in social networking applications.

Another relevant contribution to the popularization of the @robotox profile is the names of the companies and pesticide products produced, described in Figure 5.

Figure 5. Name of companies and pesticides produced



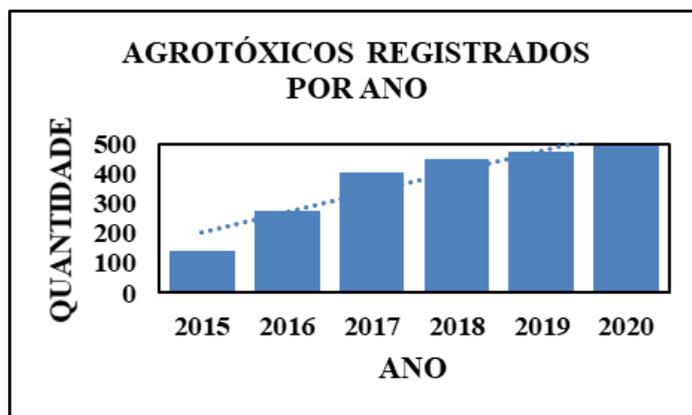
Source: Elaborated by the authors.

In line with this, Dunck (2015) points out that Brazil has an intense market growth and pesticide companies with oligopoly characteristics, including companies such as Dow, Basf, Bayer, Monsanto, DuPont and Syngenta that hold 90% of the market. In this way, it is understood that the agricultural sector shows its dependence on the fruit and poison multinationals insofar as capitalism is based on commercial relations.

5. Discussion

In addition to the data found in the @robotox profile, MAPA (Ministry of Agriculture, Livestock and Supply)/ANVISA (National Agency for Health Surveillance) documents that demonstrate quantitative data aimed at the release and year of approval of new pesticides, as denoted in Figure 6, corresponding to the time range from 2015-2020 for further analysis.

Figure 6. Graph of pesticides registered between 2015-2020



Source: Adapted from MAPA (Ministry of Agriculture, Livestock and Supply)/ANVISA (National Agency for Health Surveillance) data.

Per Figure 5, it can be explicitly observed that in 2015 (139), 2016 (277), 2017 (404), 2018 (448), 2019 (474) and 2020 (493), adding up to a total of around 2,236 new pesticides were approved in Brazil.

It is emphasized that the approval curve of new pesticides has been propagating frantically since 2016. It is based at first on the parliamentary coup instituted in the same year, instituting a political crisis that caused an imbalance in the executive and legislative powers, reinforcing the commitment of the class conservative and ending the recession. In social terms, there was calamity and setbacks to fundamental rights already established with popular and educational programs, consequently causing fiscal pedaling involving the Amazon and legislative flexibility aimed at the release of pesticides (Singer, 2016).

Despite the prevention, control and eradication of diseases and pests, as well as the availability of inputs used in the production chain and support activities that include pesticides, in a pandemic period, these activities were considered essential, prohibiting their interruption using as legislative support Law No. 14,035/20 and decree 10,282/20 (Lima; De Oliveira, 2020).

Regarding the political flexibility expressed after the year 2015 and with strong support in the years 2019-2020, they were mainly based on the various attempts Law Projects (PL) in the National Congress, accounting for a total of 30 PLs, with emphasis on PL 3,215/2000, PL 5,852/2001, PL 6,299/2002, PL 6,189/2005, PL 1,176/2015 and PL 3,200/2015 (Almeida et al., 2017).

The disputes regarding the release of new pesticides stem from the use mainly of PL 3.200/2015, which mentions in its text:

Provides for the National Policy on Plant Protection Products and Environmental Control Products, their components and the like, as well as on research, experimentation, production, packaging and labeling, transport, storage, marketing, commercial advertising, use, import, export, the final destination of waste and packaging, registration, classification, control, inspection and inspection of pesticides and environmental control products, their components and the like, and other measures (Planalto, 2015).

PL 3,200/2015 presents several setbacks before the pesticide law (Law No. 7,802/1989), including 1) Replacement of the terminology “pesticides”, allowing the minimization of the perception of toxicity that substances present to environmental and human health; 2) Loss of decision-making power of the Ministries of Health and Environment, proposing the concentration of power only to the CTNfito, nullifying the specificities of the Ministries of Health and Environment; 3) Loss of autonomy of the States, establishing the annulment that States and the Federal District constitute their legislation on pesticide regulations, facilitating the sale of illegal pesticides, consequently, increasing the exposure of workers and adjacent populations to these substances; and 4) Flexibility in cases of prohibition of registrations, this allows the continued use of mutagenic, carcinogenic, teratogenic substances, among others, prohibiting only when the risks are unacceptable (Almeida et al., 2017; Paiva, 2019).

In summary, the increase in approvals of new pesticides is intrinsically related to political attacks on environmental legislation. From the 2016 coup to the new political governance in 2019, the appreciation of conservation capital related to the implementation of agricultural multinationals has provided a catastrophe at social, environmental and political levels, devaluing the struggles of the MST, institution of public policies aimed at the registration and release of pesticides and putting an end to human health that has been generating absurd data from reports of intoxications and other pathologies and environment expressed in degradations and pollutions in terrestrial and atmospheric aquatic levels.

6. Conclusion

Creating the @robotox profile as a tool that monitors and publishes pesticide releases in real-time is an initiative that

deserves recognition and prominence. Thus, starting from preliminary analysis, the robot presents an interdisciplinary basis that dialogues with society and the various scientific fields.

The data exposed by robotox and MAPA (Ministry of Agriculture, Livestock and Supply)/ANVISA (National Agency for Health Surveillance establishes that political context, economic issues and technical neutrality favored the extensive growth of pesticides in the Brazilian context.

In short, the release of new pesticides is an aggression to society and the environment sanctioned since the 2016 coup and responded to by the current government. It demoralizes social participation and, after the agricultural coup, limits democracy to the bourgeois classes.

In addition, it is suggested to research/search for new methodological instruments that seek to monitor, denounce and report the insertion of new pesticides in specific regions of each Brazilian state in order to educate society about the risks of these chemicals to human and environmental health and their social and political implications.

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