The Agrochemical Used on Tree Monocultures that Pollutes Forever

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One of the latent dangers, generally invisible, that comes with the establishment of monoculture plantations is the high use of agrochemicals. Agrochemicals are synthetic chemical products used to control pests and diseases, which simultaneously **support the profits of plantation companies and their financiers.** Agrochemicals cause serious contamination of soil and water sources, the emergence of resistant pests and the poisoning of people and animals that live around these plantations.

One of these dangerous agrochemicals, used in bait to control leaf-cutter ants on tree plantations, poses a threat to aquifers and the health of exposed workers and communities. It is **sulfluramid, an extremely persistent ant killer that can take hundreds of years to degrade—and whose use should be banned.** Nonetheless, the use of this agrochemical has increased in Latin America due to the **expansion of eucalyptus, oil palm and pine tree monocultures;** although it is also used on various agricultural crops, on fruit trees and even for domestic use. Sulfluramid used to control ants and termites goes by the following trademarks: Mirex, Atta Kill, Fluramin, Grao Verde, Dinagro-S, Forisk AG, AgriMex, Mix-Hortall, among others.

Brazil has become the main producer and exporter of sulfluramid in Latin America and the world, since the agrochemical was taken off the market in the United States, Europe and even China—which was also a major user and exporter. Industrial production of sulfluramid in Brazil grew from 30 to 60 tons per year from 2003 to 2013. This production was for domestic use and for export, mainly to Argentina, Colombia, Costa Rica, Ecuador and Venezuela—although there is also data on exports to Bolivia, El Salvador, Guatemala, Honduras, Panama, Paraguay, Peru and Uruguay (1).

In Brazil, sulfluramid is used mainly in the states of Minas Gerais, Sao? Paulo, Mato Grosso do Sul, Espírito Santo and Bahía. **The resulting contamination of aquifers has been documented in states with large areas of tree monocultures.** The tree plantation industry has reached almost eight million hectares nationally. The expansion of this industry in Brazil and in other countries of the region—and therefore the increasing use of sulfluramid—is putting aquifers at risk for future generations and is leaving a legacy of soil and water pollution. Meanwhile, the plantation agribusiness makes millions in profits from this activity. Urgent measures must be taken to curb and eliminate the use of this agrochemical.

What is Sulfluramid, and What Are Its Impacts?

After being applied, sulfluramid turns into an extremely persistent compound, PFOS (perfluoroctane sulfonate), which is also toxic and can bioaccumulate. That is, it can move from an agricultural environment to other living organisms in the food chain. For example, **PFOS can move from the roots of certain crops (corn, wheat, vegetables, for example) to humans when food is**

ingested, bind to proteins in the blood and liver, or accumulate in other land animals. In the case of monoculture plantations, PFOS filtration occurs through aquifers, and therefore can affect other **aquatic and marine organisms and be carried over long distances**.

Sulfluramid is freely available in the region and is sold in commercial products with a green or blue band. It is labeled as slightly toxic, considering only its short-term effects. However, this hides the much more persistent impact with chronic long-term toxic effects: the transformation into PFOS, which inevitably occurs once it is in the environment. PFOS also can cause damage to fetuses during pregnancy, is a risk factor associated with weight loss, affects the liver, causes cancer—according to tests with laboratory animals (and there is some evidence that it causes cancer in humans)—and affects human beings' defense system, among other effects.

Because it is persistent, bioaccumulable and toxic, PFOS is subject to international controls aimed to eliminate or restrict it globally. These international controls are part of the Stockholm Convention on Persistent Organic Pollutants—an environmental treaty that most countries in the world have signed onto.

Sulfluramid belongs to a chemical group of compounds, called PFAS, that have long chains of fluoride and carbon that make them very stable and persistent. These substances have been used as non-stick agents in numerous products, including stain-resistant furniture, firefighting foams and fast-food packaging. The most famous product was Teflon, which was used in various cooking utensils and introduced to the market by US companies 3M and DuPont. These companies, which manufactured various compounds from the group of PFAS in the United States, have been taken to trial by affected workers and communities. US journalist, Sharon Lerne, reports how even though DuPont knew it was harming the health of employees and polluting the water, it hid this information and continued to produce Teflon (2).

The Stockholm Convention and Agribusiness Lobbies

The Stockholm Convention bans the use of sulfluramid for urban and garden use. However, the substance is sold in many Latin American countries with no regulation, which takes advantage of the fact that there are not yet tools to sanction non-compliance with this mandatory international agreement. The Convention only **permits sulfluramid for agricultural use—including for tree monocultures—**to control two kinds of leaf-cutter ants of the Atta and Acromymrex genera. As yet, no deadline has been set to end its use globally.

This exception for unlimited time was enabled due to acceptance of the recommendation of the New Persistent Organic Pollutants Review Committee expert group. This subsidiary body makes recommendations to be approved by the plenary of countries that are party to the Stockholm Convention. The Review Committee accepted arguments presented by officials from the Brazilian Ministry of Agriculture, in alliance with the Brazilian industry that produces this agrochemical. They fabricated evidence claiming that it would not be possible to effectively control these kinds of ants with another product or measure. In fact, the industries that produce this agrochemical (Atta-Kill, Unibrás and Dinagro) formed the Brazilian Association of Insecticide Bait Manufacturers (ABRAISCA, by its Portuguese acronym), which participated as an observer in the Review Committee alongside officials from the Ministry of Agriculture. Within ABRAISCA, the company Atta-Kill stands out, seeing as it belongs to the Agroceres Group—a powerful group linked to the Brazilian Agribusiness Association (ABAG, by its Portuguese acronym).

Possible Alternatives

Despite statements made by ABRAISCA and certain Brazilian Ministry of Agriculture officials, in Brazil itself there are alternative products to sulfluramid, which are authorized for organic agriculture—such as the commercial product, Biosca, which has botanical ingredients. Furthermore, various biological control agents (entomopathogenic fungi such as *Beauveria bassiana* and *Metarhizium anisopliae,* and plant extracts) have been successfully used to control leaf-cutter ants both in Brazil and other Latin American countries—such as Cuba, Mexico and Colombia. These products are made by hand or on a commercial scale.

Controlling leaf-cutter ants poses a big challenge in the case of large-scale tree monocultures. However, the solution is not to compare sulfluramid with another chemical or biological agrochemical, but to integrate a set of control measures and modify plantation management. The fact is that, ultimately, **the large-scale plantation model is in itself unsustainable and toxic.** In one way or another, **it contaminates and destroys biodiversity, forests, soil fertility and water sources; and it seriously affects the communities that live in and around these industries.**

Therefore, the discussion and evaluation of possible alternative measures (interspersing strips of native forest, planting repellant plants, using botanical or biological control agents, among others) should be part of a transparent discussion process—wherein regulating organizations prioritize public over private interest. Organizations of producers, peasants, and civil society should participate in this discussion process, as well as technicians who have no conflict of interest with the chemical industry, current governments, agribusiness or the plantation industry.

The expansion of tree monocultures that use sulfluramid is creating an environmental debt that must be averted and remediated in the region. Plantation industries and agribusiness in general—which have caused the problem—should grant funds to pay for the costs of evaluation and remediation of the environmental and social damages already caused. Damage to public health associated with exposed workers and populations should also be evaluated through effective monitoring systems. Non-agricultural uses of sulfluramid should be banned immediately. A deadline must be set to end the use of sulfluramid for agriculture, including for tree plantations. Furthermore, the exchange of successful experiences among farmers should be promoted—opening a process with the full participation of workers' organizations, communities, and civil society experts and organizations.

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On the IPEN website www.ipen.org, one can see a pamphlet in Spanish and Portuguese that details the scientific information used for this article; a report about alternatives; and memes that can be used to raise awareness among consumers and peasants, and prevent the purchase of this agrochemical.

(1) Gilljam JL, Leonel J, Cousins IT, Benskin JP (2016) *I*s Ongoing Sulfluramid Use in South America a Significant Source of Perfluorooctanesulfonate (PFOS)? Production Inventories, Environmental Fate, and Local Occurrence. Environ. Sci Technol 50 (2): 653–659.
(2) The Intercept, 2015, *The Teflon Toxic*