

CONTAMINATION OF SOILS IN HOMESTEAD

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Abstract

The term pesticide is a compound word that includes all chemicals used to destroy or control pests. In agriculture, herbicides, insecticides, fungicides, nematocides and rodenticides are used. A key factor in the Green Revolution has been the development and application of pesticides to combat a wide variety of insects and herbaceous pests that would otherwise reduce the volume and quality of food production. The use of pesticides coincides with the chemical age, which has transformed society since the 1950s. In places where intensive monoculture is practiced, pesticides are the usual method of pest control. Unfortunately, the benefits of chemistry have been accompanied by a number of harms, some of them so serious that they now pose a threat to the long-term survival of important ecosystems as a result of predator-prey relations and biodiversity loss. In addition, pesticides can have important human health consequences.

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CONTAMINATION OF SOILS IN HOMESTEAD

Seoáñez Calvo, M., 1999a, states that soil is a vital resource and is the physical support on which all living beings settle. It is also the primordial source of raw materials and constitutes one of the basic elements of the natural environment. For centuries mankind has used the soil to develop and improve its living conditions, since it is carried out all the processes of man's production, such as agriculture, industry, urban infrastructure, among others.

It was in 1992 at the Rio Summit that the importance of the protection of soils and their potential uses in the context of sustainable development was recognized, particularly against pollution from anthropogenic actions or activities.

The ground's pollution the quality of soil is associated with the presence of chemical substances defines how the increase in the concentration of chemical compounds, of anthropogenic origin, causes detrimental changes and reduces their potential use, both by human activity and nature.

Causes of soil pollution

The causes of soil pollution are associated with certain winds such as: the atomic tests, such as those made by the British in Australia, which cause the soil to be subjected to decontamination for thousands of years; Nuclear accidents like Chernobyl show the incredible and enormous contamination of soils, water and atmosphere, as a result of lack of common sense or restrictive laws to possible sources of contamination; On the other hand, among the most common causes of soil pollution are: the use of agricultural technology in the harmful use of sewage or polluted waters of rivers; Indiscriminate use of pesticides, pesticides and hazardous fertilizers in agriculture; Lack or improper use of urban waste disposal systems; Industry with anti-regulatory waste disposal systems; Contamination of the soil by pouring plastics, among others.

Consequences of soil contamination

Among the consequences of soil contamination we can mention the alteration of the biogeochemical cycles, among which are the cycle of carbon, oxygen, phosphorus, sulfur and nitrogen, among others. These elements and derived processes go from land to air and water and also circulate between different living things and due to artificial contaminants, can be modified. On the other hand, groundwater pollution, groundwater accounts for 97% of all fresh water on the planet and can be contaminated by soil contamination of soil contaminants as pesticides used in excess in agriculture. The excess nitrogen deposited in the soil with fertilizers is stopped by filtration to the groundwater contaminating them. Another factor of importance is the interruption of biological processes, in which contaminated soil prevents the development of wildlife, without food or clean water, the species migrate or suffer irreparable damage to their procreation chain. This process then suffers what is called "degradation of the landscape" and therefore a loss of soil.

Some solutions to this problem may be: Eco-agriculture is gradually gaining ground in artificial agriculture, especially in European countries and in some poor communities seeking alternative food production. Ecoagriculture does not use pesticides or agrochemicals; The recycling of plastics, batteries, glasses or oils for cars and kitchens because they are elements that take many years to degrade, so this action contributes to keep our soil free of contaminants; The actions focus on improving recycling plants to reduce soil pollution and, at the same time, water pollution, proper recycling of waste and treatment of waste and promotion of renewable energy.

Pesticides. Pesticides are substances or a mixture of substances that are used intensively to control agricultural pests and insects vectors of diseases in humans and animals, as well as for the control of insects and mites that affect the production, processing, storage, transport Or marketing of food, agricultural products, wood and animal feed (FAO, 2003).

However, it is recognized that they are chemically complex substances which, once applied in the environment, are subject to a series of physical, chemical and biological transformations (adsorption and absorption phenomena on soils and plants, volatilization, photolysis and chemical degradation the microbial). In addition they can also be carried away by the currents of air and water that allow their transport to great distances; it must be added that the volatile residues pass into the atmosphere and return with rain to other places (López-Geta et al., 1992). These transformations can lead to the generation of fractions or to the total degradation of the compounds that in their various forms can affect the different levels of an ecosystem (Garrido et al., 1998).

Pesticides, heavy metals and other impurities are considered by the Environmental Protection Agency (EPA, 1992) as contaminants of aquifers due to their high toxicity, persistence and mobility, as well as affecting important hydraulic loads such as ponds and canals Of irrigation; And their physicochemical properties, are resistant to biological degradation (Hirata, 2002).

At present, one of the major problems is the indiscriminate and uncontrolled use of these compounds, only in 1992 the world production of pesticides was estimated at 10 mill. Of ton. (López-Geta et al., 1992); of these more than 80% were used in Europe and the United States. Until the middle of the last century, about 40 compounds of botanical or inorganic type were used, among them, lead arsenate, copper aceto-arsenate and a mixture of copper sulfate and lime known as Caldo Bordelés (Albert, 2005). However, at present there is a lack of knowledge of the quantity and types of pesticides (active ingredients) applied in the fields; As well as the scarce control of wastes that are constantly exposed to environmental factors and are sometimes reused again.

In spite of the large number of agrochemicals that are constantly used, little is known about their toxicity in organisms, including humans, as well as the global environmental

impact. In this regard, soils that are the source of food globally, are vulnerable to the processes of degradation, desertification and their effect on the ecosystems they sustain. Among the risks are the loss of soil fertility, from the damage to humus and nutrients that make them productive, such as phosphorus, nitrogen, potassium and others (Orozco-Abundis, 2006). On the other hand, the inorganic particles that integrate the soil allow the accumulation and dispersion of pesticides, not only in the agricultural fields but also in the aquatic environments and organisms, which will depend on the persistence and degradation of the compounds (SEMARNAT, 2005). In this regard, FAO (2003) indicates that it is necessary to make regulations on the use and application of these compounds, especially to have a register and carry out monitoring programs on environmental pollution, intoxication and monitoring of the residues generated by these Compounds.

Pesticides include a wide variety of chemical compounds. Some are persistent; others are not persistent. Persistent chemicals, such as DDT, dieldrin and toxaphene, do not break down rapidly and accumulate in the environment.

Non-persistent pesticides, such as malathion or parathion, are most commonly used in Florida, especially in the southern Dade area, where they are used in citrus and vegetable farms. In 1969-70, they applied to nearly 11,900 acres of citrus and 47,000 acres of vegetable farms in Dade County. Approximately one million pounds of persistent pesticides were used annually on urban and agricultural land in the 1960s in Dade County.

Both persistent and non-persistent pesticides are found in the air, water, plants, and animals of South Dade County, predominantly persistent as DDT. Concentrations are usually at trace levels or below detectable levels in water, but at higher levels in bottom sediment and biota. Concentrations above 1000 μ / kg have been found in birds and mammals. A concentration of more than 16,500 μ / kg was measured on a bald eagle.

The accumulation of persistent insecticides in some birds causes metabolic disorders in their reproductive processes. Increasing concentrations of DDT coincide with the death and decreasing numbers of some species, particularly hawks, eagles and pelicans. Although local use of DDT and other persistent insecticides is declining, accumulation may continue for years as a result of the long life of some pesticides (up to 20 years for the DDT family) and as a result of extensive use elsewhere the world and the final atmospheric transport to Dade County. This is of particular concern in Everglades National Park because birds are a major attraction

Pesticides accumulate in humans at levels thousands of times greater than those of the water they drink and the food they eat. The mean total human fat DDT concentrations of Caucasians older than 5 years in Dade County were 8.4 $\mu\text{g} / \text{kg}$. For comparison, the concentrations in Caucasians from other 22 states ranged from 3.98 to 13.23 μ / kg . States with warm climates had higher averages (9.21 μ / kg) than those with cold climates (4.85 μ / kg). The effects of such concentrations on human health are not known

Impact on the environment. Unfortunately, terrestrial and marine aquatic systems are the most threatened by the contribution of pollutants such as pesticides, fertilizers, heavy metals, pathogenic organisms and others, through the increase of anthropogenic activities in adjacent areas that alter the natural conditions of ecosystems, including humans. The importance of water bodies, active biological sites, lies in the biological diversity and biogeochemical processes that are performed.

Alternatives to avoid pollution in agricultural fields. Ecological agriculture. It is a system of sustainable agricultural production that is used in Europe and is conceived as a viable alternative to the traditional approach of agriculture, food security and environmental problems (Orozco-Abundis, 2006). Based on the environmental and health risks of chemical pesticides, it is necessary to develop technology for the development of new biodegradable

formulas for pest and disease control in the region, which are favorable to agriculture and the environment.

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