

PESTICIDES

HOW TO AVOID DAMAGE AT HEALTH AND ENVIROMENT?

What are pesticides?

Pesticides are chemical, physical and biological products used in the control of living creatures considered harmful to man, your breeding and your plantation. They are also known by other names as agrochemicals or phytosanitary products. Among these terms, the term “agrochemicals” is the term used by Brazilian legislation.

Between pesticides or agrochemicals there are products that control weeds (hebicides), insects (insecticides), fungus (fungicides), bacterias (bactericides), mites (acaricides) and rats (rodenticides). Also are considered pesticides, growth regulators, which accelerate the ripen and flower plants, for example.

Who do they impair?

Although pesticides are used aiming to control beings considered harmful, they also poison many other animals and plants, including beneficial ones (such as worms, bees and fish), besides man himself. For this reason of worry with its use and abuse.

How does intoxication occur and what type of damage does it cause?

The organism absorbs pesticides through ingestion, inhalation or contact with the skin and mucous membranes (mouth, nose, eyes). This can occur through direct contact, in the preparation, handling or application of the pesticide; or indirect, by ingestion contaminated water and food. Thenceforth, damage can occur due to two types of intoxication: acute and chronic. Acute intoxication occurs when a victim is exposed to high doses; in this case, the symptoms appear quickly, after a few minutes at hours after exposure. Symptoms changed between the various types of pesticides, but they include, in the case of human health: headache, abdominal pain, diarrhea, nausea, vomit, eye and skin irritation, blurred vision, chest tightness, difficulty breathing, intense sweating, cramps, tremors, cardiac arrhythmias, seizures, coma and death. In turn, chronic intoxication occurs when a victim is exposed to smaller doses, however, for a long time, such as months or years. Chronic intoxication can have serious consequences for human health, including paralysis, sterility, abortions and damage to the development of diseases and cancer, among others.

What is the active ingredient and why is it important to know it?

Pesticides are found on the market in the form of formulations that include one (or more) active ingredient (s), which is the substance that has an action on the target organisms;

and inert ingredients, that is, those that have the function of diluting the active ingredient and facilitating its dispersion or penetration into the target organism.

It is important to know the active ingredient because in general (but not always) it is responsible by toxicity of the formulation, and because we often find several formulations with the same active ingredient. For example, in Brazil there are about 40 different products containing glyphosate as the only active ingredient. These products may vary in the concentration of glyphosate contained and in the type of inert ingredients used, but the mode of action of the product will be basically the same.

How to avoid the damage of pesticides to man and the environment?

1. To avoid the use of pesticides

Since pesticides are by definition toxic products, no doubt, the most effective alternative to avoid their risks to man and the environment is to avoid or even not to use pesticides. This can be done through practices that inhibit the proliferation of pests and diseases, such as polyculture, crop rotation and the use of more resistant plant varieties; or through other pest and disease control practices, such as the mechanical removal of weed, use of traps, and use of biological control, that is, the creation, release or favoring of natural pests enemies.

These practices (among others) make up 'integrated pest management', which seeks to use a combination of pest control tools (and not just pesticides) and only when the infestation is able of causing relevant damage, and 'organic agriculture', which seeks to bring agricultural production closer to natural ecological processes. In the last case, only natural pesticides are allowed. Organic agriculture may not apply to all models of agricultural production, but it is clearly better for the health of the farmer and the consumer and for fauna, flora and the environment in general. Besides, it results in saving water, fuel and money for the producer, given the high costs of pesticides and fertilizers. For these reasons, the market for organic products is growing in Brazil and worldwide.

2. If you choose to use pesticides

Firstly, it is very important that the producer always consult an agronomist to choose the most appropriate product and application. See the end of this leaflet for technical support.

2.1. To give preference to pesticides that are less harmful to human health and biodiversity, and less persistent in the environment

Every pesticide in Brazil displays on the label its toxicological classification (potential for risk to human health) and its environmental classification (potential for risk to the environment). The toxicological classification receives a color code (below).



Toxicological Classification

CLASS I
Extremely Toxic

CLASS II
Highly Toxic

CLASS III
Fairly Toxic

CLASS IV
Low Toxic

Environmental Classification

CLASS I
Highly Dangerous to the Environment

CLASS II
Very Dangerous to the Environment

CLASS III
Dangerous to the Environment

CLASS IV
Low Dangerous to the Environment

It is important to note that all pesticides are toxic to human health and the environment. Thus, a red band pesticide carries a risk even when exposure is small, or be, even if the organism is exposed to it for a short time or at low doses. However, a green band pesticide also brings risk if exposure to it is large, that is, if the organism is exposed to it for a long time, or at high doses. Or be, whenever possible use pesticides whose active ingredients are less toxic to human health and the environment, but also pay attention to the use of the recommended concentrations and avoid prolonged exposures.

In addition, it is important to remember that this classification refers only to the toxicity of the formulation, which is, basically, the dose necessary to cause death in the short term. In other words, it says nothing about the long-term effects or the * mode of action *. This information is also very important, because some substances cause considerable specific damages. Among the active ingredients legally used in soybean culture, the following can be cited as examples:

Carcinogenic - the herbicides acetochlor, alachlor, diclofop-methyl, diuron, lactofem; the fungicides captana and chlorotalonil; the insecticide thiodicarb; and some types of mineral oils used as adjuvants are the causers of cancer. The fungicides cyproconazole, epoxiconazole, cresoxim-methyl, tetraconazole, thiophanate-methyl and tolifluanide and the insecticides permethrin and thiacloprid are probably carcinogenic.

Toxic to the reproductive system or to the development of fetuses - the herbicides alachlor, diclofop-methyl, diuron, metribuzim; the fungicides carboxine, myclobutanil, propiconazole, thiophanate-methyl and tiram; and the insecticides abamectin and bifenthrin.

Toxic to the nervous system - the herbicide ethephon and the insecticides acefate, carbosulfan, chlorpyrifos, phenitrothione, metamidophos, metomil, parationamethyl, profenofós, protiofós, thiodicarb, and triazofós.

Harmful to the hormonal system (hormones are substances produced by our body that regulate several important activities, such as our growth, development and reproduction) – the herbicides acetochlor, alachlor, metribuzim, and trifluralin; the fungicides fenarimol and tiram; and the insecticides bifenthrin, deltamethrin, phenitrothione and lambda-cyhalothrin

Persistent in the environment, that is, they remain in the environment for a long time - the herbicide pendimethalin, the fungicide fluazinam, and the insecticide fipronil.

Groundwater contaminants and, therefore, they can contaminate the well water source –alachlor, diuron and S-metolachlor are known as groundwater contaminants; many others are potential contaminants of groundwater, such as the herbicides 2,4-D, clethodim, clomazone, diquate dibromide, glufosinate - ammonium salt, glyphosate, glyphosate - isopropylamine salt, glyphosate - ammonium salt, glyphosate - salt potassium, imazetapyr, metribuzim, paraquat dichloride, setoxidim, and sulfentrazone; the fungicides azoxystrobin, chlorothalonil, fenarimol, fludioxonil, flutriafol, cresoxim-methyl, metalaxyl-M, propiconazole, pyraclostrobin, tebuconazole, tetraconazole, thiophanate-methyl; and the insecticides Acephate, Chloranthaniliprole, Clothianidin, Fipronil, Imidacloprid, Metamidophos, Metomyl, Methoxyfenozide, Parathione-Methyl, Profenophos, Tebufenozide, Thiamethoxam.

Remember that the name of the active ingredient appears on the label and package insert of all pesticide formulations.

Finally, prefer products that have a more specific action, that is, that target only the pest or group of pests that you want to control.

2.2. Use good quality pesticides, in the recommended dose, and if really necessary, that is, if the level of damage caused by the pest justifies the use of pesticides.

Federal legislation defines which pesticides can be used in each crop (that is, which pesticides are 'registered' for soybeans, cotton, corn, and so on). Federal legislation also defines, for each pesticide, the minimum and maximum doses to be used in the case of infestation by each pest. These doses are defined based on technical studies evaluating,

for a side, the effectiveness of the treatment, and for other, minimizing the risk of using the pesticide.

Besides that, the legislation determinates that can only be purchased with an agronomic prescription, in the same way that many medicines can only be purchased at the pharmacy with a prescription. Or be, it is not only important to consult an agronomist, it is mandatory by law!

Products made without proper technical control can be more toxic due to the presence of impurities or less efficient if they have concentrations of active ingredient below what is declared on the label.

Finally, many producers use pesticides in a 'preventive' way, that is, even before the appearance of pests! When this is the case, there is a risk to human health and the environment, but there is no benefit from control. That is why it is of great importance that the producer periodically monitors the presence of the pest in the field to find out if there is a possibility of damage to the crop or not. Often the level of damage, if present, is much less than the cost of pesticides and their application!

2.3 Take all precautions to avoid exposure of people, animals and environment.

Before using the pesticide, read the label, package insert and recipe. If you don't understand its contents, ask at agronomist or agricultural technician!

2.3.1. Apply in more suitable environmental conditions

The producer must be aware of the most appropriate environmental and climatic conditions for the application of pesticides. Avoid application in the hottest and driest hours of the day, in windy days and aerial application. In these conditions, a greater part of the pesticides evaporates and / or is carried by the wind, reducing the effectiveness of the application and, therefore, increasing the waste and the loss of the producer's investment. More seriously, under these conditions, it increases the risk of exposure by inhalation and the transport of pesticides outside the plantation, contaminating forests, rivers, lakes and houses.

It should also be avoided the application in times of intense rain, because a greater part of the pesticides is washed from the field, thus reducing the effectiveness of the application and, therefore, increasing the waste and loss of the producer investment and the contamination of the soil, groundwater, rivers, lakes and dams.

Pesticides should never be applied near water courses. In fact, one of the several important functions of maintaining a preserved riparian forest along water courses (besides to being required by law) is the protection of water resources against contamination by fertilizers and pesticides.

2.3.2. Take proper care when storing and handling pesticides and returning your packaging

According to the law, pesticides must be stored closed in their original packaging and locked in an exclusive deposit for toxic products. This place must be of masonry or other non-combustible material, covered, ventilated and with an impermeable floor. There should also be a warning sign with a danger symbol, which reads "CAUTION POISON". The defensive package insert contains important additional information, such as what to do in case of leaks.

Whenever handling pesticides (and especially when preparing the syrup and applying the product), use PPE (Personal Protective Equipment). The most suitable PPE is described in the product package insert. In general, it includes long-sleeve overalls, waterproof apron, rubber boots, nitrile gloves, visor or goggles, "Arab cap" and mask with chemical and / or mechanical filter.

After use, it is mandatory by law to wash the pesticide packaging and return it to the place of purchase of the product or to the receiving units informed in the purchase invoice.

The packaging must be washed by pressure or by means of a 'triple wash'. Through triple washing, the pesticide is used more complete and reduces the risk of contamination of man and the environment

How is the triple washing done?

Always using the PPE, invert the pesticide packaging over the spray tank or syrup preparation container and let it drain for at least 30 seconds. The dripping of the drops of pesticide will start to be well spaced until it stops. When this happens, pour water into the package up to about a quarter of the volume, cover tightly, shake the package and pour the washing water into the spray tank or syrup preparation container. Repeat this operation three times.

After the triple wash, pierce the bottom of the package to prevent it from being reused, and store it in a suitable place to later return it to the indicated location.

Flexible plastic, paper or metallized packages cannot be washed. They must be collected in a standardized transparent plastic bag (the "Big Bag") acquired at the place where the pesticides were purchased. At the end, deliver the 'Big Bag' to the receiving units informed in the purchase invoice

Attention: Is extremely serious the reuse of pesticide packages and the transfer of pesticides to unsuitable container or those that are not well labeled, since it carries a high risk of accidents. The biggest victims of pesticide poisoning are, in many cases, children. Take all precautions so that it never happens!

Attention: never wash packages, bombs or tanks in rivers, lakes e dams