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Pesticides and Their Types

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SUMMARY

Chemical substances known as pesticides are applied to eradicate or manage pests. Pesticides are frequently used to protect crops from pests that have negative impacts on agricultural yield or productivity. Pesticides are employed to safeguard the field's standing crops. According to the sorts of pests they control, pesticides are classified. There are numerous uses for pesticides. Insecticides, fungicides, bactericides, herbicides, algaecides, nematicides, rodenticides, larvicides, molluscicides, piscicides, and ovicides are just a few of the numerous categories they fall under. Pesticides that are chemical or synthetic and biopesticide are included in the other categories. The use of pesticides has a number of benefits and drawbacks.

INTRODUCTION

Pesticides are helpful to control or kill the targeted pests and to protect the crops. Pesticides are very helpful to protect the storage and conserve the yield. They have a negative impact if they do not use within the safe limit. Pesticides are used to control pests which are harmful or toxic to the environment. Pesticides can adversely affect the health of humans and animals. Pesticides compete with humans for food and spread diseases. They are also classified into two groups depending on how biodegradable they are. They are biodegradable or non-biodegradable in nature. Pesticides can be chemical, biological agent, antimicrobial, disinfectants, etc.

Fig: Different types of pesticides

CLASSIFICATION

There are two types of pesticides as mentioned below:

1. Chemical or Synthetic Pesticides:

They are man-made chemicals specially designed for killing or repelling pests. They not only used in agriculture but also in other industries. Chemical pesticides are obtained from natural materials and then undergo a chemical reaction in the laboratory. Both natural and synthetic pesticides are found in that product which we use in our everyday life. Nowadays, farmers are using synthetic pesticides to prevent their crops from pests and this is the most common method of controlling pests. Synthetic pesticides are also classified into several types.
Examples: Diazinon, Malathion, Acephate, Propoxur, Glyphosate, Metaldehyde, Boric Acid, DDT, Dursban, Deet, etc.

Types of synthetic pesticides:

Synthetic pesticides are classified into various categories based on the type of pest they control. Exposure to pesticides can cause short term (acute) or long term (chronic) effects on health of humans and animals. They effects on reproductive, endocrine, and central nervous systems. The main classes of synthetic pesticides consist of organochlorines (OCs), organophosphates (OPs), carbamates and pyrethroids.

A) Organochlorine (OCs):

Organochlorine pesticides are the chlorinated hydrocarbons widely used for mosquito control and in agriculture. These are an organic compound with high persistence and toxicity characteristics. These type of pesticides causes neurological damage and endocrine disorders. They are responsible for the contamination of the environment significantly that affects the ecosystem. The common organochlorines and DDT are banned in the United States and Europe, but they are still manufactured and used in the developing countries for controlling mosquitoes that cause malaria. Examples of this group are DDT, methoxychlor, dieldrin, chlordane, toxaphene, mirex, kepone, lindane, and benzene hexachloride, etc.

B) Organophosphates (OPs):

This is a class of insecticides of which several are highly hazardous. This are esters of phosphoric acid and thiophosphoric acid. Pesticides that damage the acetylcholinesterase enzyme in the body comprise organophosphate insecticides (such as diazinon). Veterinary practices, residences, gardening, and agriculture all make use of organophosphates. Organophosphates are more toxic to targeted organisms such as insects. Malathion, dibrom, chlorpyrifos, temephos, diazinon and terbufos are some examples of organophosphates.

C) Carbamates:

Carbamate is a class of organic compounds which is derived from carbamic acid. Carbamates are a class of insecticides. These are similar to organophosphates by structurally and mechanically. Aldicarb, carbofuran, carbamyl, ethienocarb, fenobucarb, methomyl, and oxamyl are some examples of carbamates.

D) Pyrethroids:

Pyrethroid is a class of insecticides used to control or kill insects. Purified pyrethrum is known as pyrethrin. It is very effective to kill insects as well as mites. Pyrethroid is a group of man-made pesticide which is similar to the natural pesticide pyrethrum. Pyrethroids are applied at very low levels to control insects and mosquitoes.

2. Biopesticides:

Biopesticides are formulated by naturally occurring substances that control pests by non-toxic mechanisms and are environment friendly. They do not cause pollution, relatively cheaper and are preferred in a growing market. Biopesticides not only decomposes quickly but also specific to the targeted pests. Biopesticides are certain types of pesticides derived from the natural materials such as animals (Nematodes), plants (Chrysanthemum, Azadirachta), microorganisms (*Bacillus thuringiensis*, *Trichoderma* and *Nucleopolyhydrosis*) and living organisms (Natural enemies). The use of biopesticides is safe than the use of chemical or synthetic pesticides. Microbial pesticides, plant-incorporated protectants and biochemical pesticides are categories involved in biopesticides.

CONCLUSION

Pesticides are widely used to control or eliminate pests in order to protect crops from diseases and to increase agriculture produce. Biopesticides has several advantages than using synthetic or chemical pesticides. If we use pesticides beyond their safe limits, it has a negative impact on human, animal, and environmental health.

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