

Awareness campaign among farmers in neighborhood region regarding handling pesticide and adverse effect of overdoses.

- **ABSTRACT:-**

The intensive development of agriculture means that more and more toxic organic and inorganic compounds are entering the environment. Because of their widespread use, stability, selective toxicity and bio accumulation, pesticides are among the most toxic substances contaminating the environment. They are particularly dangerous in fruit and vegetables, by which people are exposed to them, it is therefore crucial to monitor pesticide residues in fruit and vegetables using all available analytical methods. In the decade, there has been a tremendous increase in the guilds of various crops to meet the demand of our growing world population. This great feat has been achieved by adopting new methods of forming and by expensive use of fertilizers and insecticides. A pesticide is any substance is mixture of substance intended for preventing, destroying repelling or mitigating any pest. A pesticide may be a chemical substance, biological agent antimicrobial disinfectant or device used against any pest.

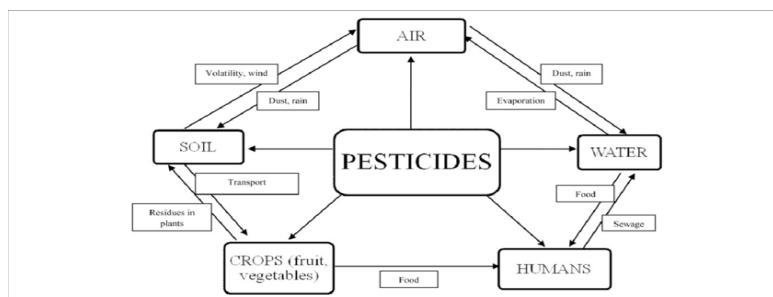
- **INTRODUCTION:-**

Pesticides are a numerous and diverse group of chemical compounds, which are used to eliminate pests in agriculture and households. They enable the quantities and the quality of crops and food to be controlled, and help to limit the many human diseases transmitted by insect or rodent vector. However, despite their many merits, pesticides are some of the most environmentally stable and mobile substances in the environment. Their excessive use has a deleterious effect on humans and the environment, their presence in food is particularly dangerous with their environmental stability, ability to bio accumulate and toxicity, pesticides may place the human body at greater risk of disease and poisoning. Pesticides enter the environment in various forms (e.g. powders, moistened powders, powders for preparing aqueous solutions, and concentrates for making up emulsions or sprays).

Pesticides are of enormous importance in increasing the yields and quality of agricultural products. They are used to:

- Control the numbers of pests destroying whole plants or their parts
- Increase the production of animal and plant biomass; Combat micro-organisms causing farm produce to rot and to decay;
- Combat algae, bacteria, fungi and weeds:

- Kill harmful organisms in farm buildings, the home, hospitals, stores and vehicles.
- The widespread use of pesticides not only contaminates water, soil, and air, but also causes them to accumulate in crops (e.g., fruit and vegetables). Pesticides are transported mainly by rain and wind from their points of application to neighbouring crops and land, where their presence may be undesirable or harmful. The quantities of pesticides in any particular region depend to a large extent on the intensity of pesticide. Application and the types of crops grown there. Combat animal pests damaging crops (e.g., mites, aphids, insects, Larvae, and nematodes);

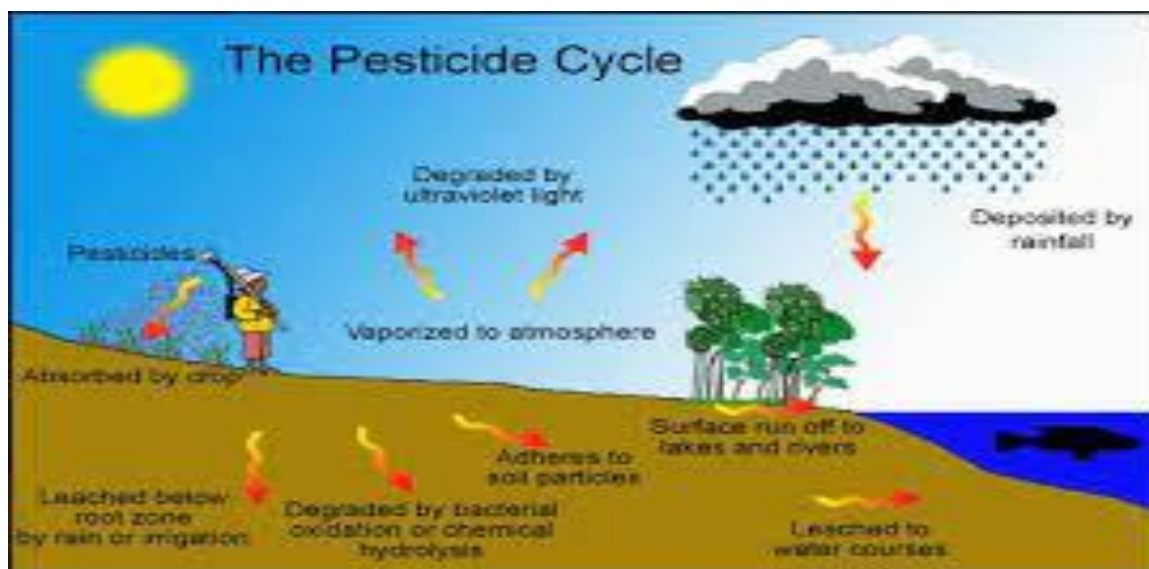


- Stimulate or inhibit plant-growth processes (e.g. remove excess flowers, destroy foliage or dry out plants)
- Make possible the action of other substances; counteract growths on boats and ships; and,
- Combat animal pests damaging crops (e.g., mites, aphids, insects, Larvae, and nematodes);

• ADVERSE EFFECTS:-

Pesticides have many advantages, but they also do much harm to the environment. In view of both positive and negative effects of pesticides; we should aim to achieve full selectivity of their action. Nonetheless, the latest studies show that pesticides still constitute a hazard to the environment and human health.

Each year, 140,000 tons of pesticides are sprayed onto crops in the European Union (EU) alone. Fruit and vegetables are the crops most likely to be contaminated by pesticides, particularly grapes, citrus fruits and potatoes.



According to data from the EU's Pesticide Action Network, as of 2008, some 350 different pesticides were detected in food produced in the EU. More than 5% of products contained pesticides at levels exceeding the EU's maximum permitted level (MPL).

Structurally, they can be divided into inorganic and organic compounds; the inorganic include arsenic insecticides, fluoride insecticides, inorganic herbicides and inorganic fungicides, while the organic comprise organochlorine, organophosphorus and organonitrogen pesticides. Organophosphorus pesticides (OPPs) (eg, dichlorvos, methyl parathion, chlorpyrifos, diazinon, demeton S-methyl phosalone, fonofos, metamidofos, monocrotophos, chlorfenvinphos, fenitrothion, Malathion) are the principal group of compounds used to protect plants.

They include all organic compounds containing phosphorus and are used to combat pests in industrial plantations, orchards and vegetable cultivation. OPPs usually have an ester structure, decomposing fairly easily on the surfaces and interiors of plants, and in the soil. Their toxicity depends on inhibiting the activity of enzymes controlling the functions of the nervous system, mainly acetylcholinesterase. They permanently bind the group hydroxylating the enzyme, which prevents acetylcholinesterase from decomposing and act through contact or systemically. Blockage of cholinesterase activity causes the amount of acetylcholine at the synapses to increase, leading to a state of hyperarousal, and paralysis of the muscles and the main respiratory centre.

Apart from OPPs, Organonitrogen Pesticides (ONPs) also play a major part in combating pests. ONPs include phenylureas, carbamates, and triazines and their derivatives (e.g., aminocarb, propoxur, carbonyl, simazine, atrazine and propazine). Even though they are less stable in the environment than OCPs, they can get into the human digestive system, thus posing a health hazard.

Some carbamate insecticides can be teratogenic doses and nitrosated to form strongly carcinogenic nitrosocompounds.

OCPs, including Aldrin, chlordane, lindane and DDT have been withdrawn from use in many countries because they are very toxic towards humans. But because of their considerable stability in the environment (as long as 30 years), they may still be present there and can be transported by air or water over long distances. While ONPs and OPPs are not very toxic, their improper application can also lead to their presence in farm produce (e.g., fruit and vegetables). Even though they facilitate improvement in crop yields and quality, they do pose a risk to consumers. That is why international organizations have established maximum residue levels (MRLs) of pesticides in food.

Pests include insects, plant pathogens, insects, molluscs, birds, mammals, fish, nematodes and microbes that destroy property, spread disease or are a vector for disease or cause a nuisance.

- Although there are also drawbacks, such as potential to humans and other animals. The term includes substances intended for use as a plant growth. Farmers use insecticides to protect their crops from insect damage. In urban areas, public health officials use them to fight mosquitos and that insect carry germs. People use insecticides indoor to control pests and ants and cockroaches.

CLASSIFICATION:-

Pesticides classified according to the pests they control. The four main types of pesticides are.

A. Herbicides

Herbicides eliminate plant threats grow where they are not wanted. Farmers use them to reduce weeds in such public areas as parks and ponds. People use herbicides in their yards to get rid of Crab grass, Dandelions and other weeds.

B. Fungicides

Certain fungi cause disease and may infect both plants and animals including human beings. Fungicides control plant diseases that infect food- crops-wood used for building houses in often treated with fungicides to prevent dry rot.

C. Rodenticides

Colloquially "rat poison" are typically non-specific pest control chemicals made and sold for the purpose of killing rodents. Some rodenticides are lethal after one exposure while others

require more than one. Rodents are disinclined to gorge on an unknown food (perhaps reflecting an adaptation to their inability to vomit), Preferring to sample, wait and observe whether it makes them or other rats sick. This phenomenon of bait shyness or poison shyness is the rationale for poisons that kill only after multiple doses.

Besides being directly toxic to the mammals that ingest them, including dogs, cats, and humans, many rodenticides present a secondary poisoning risk to animals that hunt or scavenge the dead corpses of rats.

D. Insecticides

Farmers use insecticides to protect their crops from insect damage. In Urban areas public health officials use them to fight mosquitoes and that insects carry germs. People use insecticides indoor to control pests and ants and cockroaches.

Alternative ways for Pest Control:

Continuing problems arising from the wide spread use of board spectrum insecticide creates a dilemma how best to control pest and at the sometime how to remove environmental hazards

Restrictions on use of pesticides and the substitution of pests on controlling use of pesticides is by far the best method.

Restrictions can mean simply more limited use or total banning or chemical Many countries have limited or banned the use of DDT and other chlorinated hydro carbons insecticide but this group of chemicals is widely used mainly in the third world countries.

The US department of agriculture has campaigned for the safe use of pesticides but from environment point of view no broad spectrum biocide can be used. Traditional insecticides such as pyrethrum or non-persistent chemicals such as carbonate sevin are now very widely used and totally new types of pest control are useful in particular cases. For example the autodial (sub destroying) techniques makes use of sterilized nales population. Large-scale rearing, radiation sterilizing and release programme are now major effects of the US Department of agriculture and are highly effective in restricted situations.

Control of insects by synthetic growth hormones is also effective in limited situations but is better described as on active area of biological research than a general alternative to pesticide use. The technique use extracts of juvenile hormone or their synthesized mimics.



Experimental procedure for finding pesticide residue

REQUIREMENTS:-

1. Mortar
2. Pestle
3. Beakers
4. Funnel
5. Glass rod
6. Filter paper
7. China dish
8. Water bath
9. Tripod stand
10. Fusion-tubes

11. Knife
12. Test-tube
13. Samples of fruits & vegetables
14. Alcohol
15. Sodium metal
16. Ferric chloride solution
17. Ferrous sulphate crystals
18. Distilled water and
19. Dilute sulphuric acid.

- Experiment Procedure:-

1. Heat a small piece of dry sodium in a fusion tubes, till it melts. Then add Take different kinds of fruit and vegetables and cut them into small piece separately.
2. Transfer the cut piece of various fruits and vegetables in mortar separately and crush them,
3. Take different beaker of each kind of fruits and vegetables and place the crushed fruit and vegetable in these beakers, and add 10ml of alcohol to each or these. Stir well and filter collect the filtrate in separate china dishes.
4. Evaporate the alcohol by heating china dishes one by one over water bath and let the residue dry in an oven.
5. One of the above residue from china dish to the fusion tube and heat till red hot. Drop the hot fusion tube in china dish containing about 110ml of distilled water. Break the tube and boil the contents of the china dish for about 5 minute to cool and filter solution. Collect the filtrate.
6. To the filtrate add 1ml freshly prepared ferrous sulphate solution and warm the contents. Then, add 2-3drops of ferric chloride solution and acidity with the dil. Hydrochloric acid if a blue or green precipitate or colouration is obtained, it indicated the presence of nitrogen containing insecticide.
7. Repeat the test of nitrogen for residue obtained from other fruits and vegetable and record observation

Symbols/ Shapes	Interpretation
A. Poisonous / Hazards	
	Extremely Toxic (Acute Oral LD 1-50 mg/kg)
	Highly Toxic (Acute Oral LD50 = 51-500mg/kg)
	Moderately Toxic (Acute Oral LD50 = 501-5000mg/Kg)
	Slightly Toxic (Acute Oral LD50= >5000 mg/kg)
B. Flammability Hazard	
	Danger Flammable (Liquid Flash Point < -6° C)
	Warning Flammable (Liquid Flash Point= -6° C to 10° C)
	Caution Flammable (Liquid Flash Point= 10° C to 27° C)
C. Explosive Hazard	
	Caution Explosive
D. Corrosive Hazard	
	Danger Corrosive (Acid/alkali <10%)
	Warning Explosive (Acid/alkali= 5-10%)
	Caution Corrosive (Acid/alkali = 1-5%)

Table 4: Various symbols used on Pesticides Labels

- **CONCLUSION:-**

Thus from the above experiment we conclude that the fruits and vegetables that we consume especially grapes, tomato and potato contain nitrogen containing insecticides and pesticides.

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