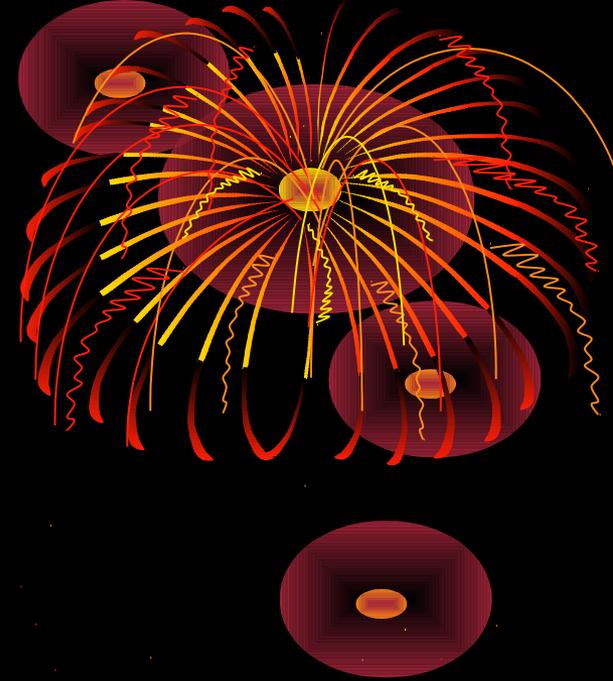


Presentation on Pesticides



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PESTICIDES

- ❖ A pesticide is a substance or mixture of substance intended for preventing, destroying, repelling or lessening the damage caused by the pest.
- ❖ A pesticide can be a insect, plant pathogen, weed, bacteria, bird etc. That compete with the human for food, destroy property, spread disease.
- ❖ A pesticide can be a chemical, biological agent, antimicrobial, disinfectant etc.
- ❖ Many chemical pesticides are poisonous to human and animals.



Classification of pesticides

- 1. Herbicide**-These are the chemicals used to kill weeds (i.e., unwanted plants) e.g. **Borax, Nitrofen.**
- 2. Insecticide**-These are used to kill insect. E.g. **DDT, BHC.**
- 3. Rodenticide**-These are used to kill rodents. e.g. **Warfarin, Zinc phosphide.**
- 4. Nematicide**-These are used to kill nematodes e.g. **DBCP, Phorate**
- 5. Molluscicide**-These are used to kill molluscs e.g. **Sodium pentachlorophenate.**

6. Fungicides-These are used to kill fungus e.g.
Bordeaux mixture

7. Algaecides-These are used to kill algae e.g.
Copper sulphate, Endothal

8. Bactericide-These are used to kill bacteria e.g.
Dichlorophen, Oxolinic acid

9. Piscicides-These are used to kill fishes e.g.
Trifloro methyl nitrophenol(TFM)



Chemical or Synthetic Pesticides

- ❖ **Organochlorenes**-These are non-biodegradable and persist in soil for long time e.g., **DDT, BHC, Endosulfan, Aldrin.**
- ❖ **Organophosphate**-These are esters of alcohols with phosphoric acid or with some other acids. These are very toxic acetyl-cholinesterase inhibitors as a result of which the breakdown of acetyl choline stops. The accumulation of acetyl choline resulting in convulsion paralysis and death e.g., **Malathion.**
- ❖ **Carbamates**-They are derived from carbamic acid. Mode of action of carbamates is almost similar to organo- phosphates e.g., **Carbaryl, Dimetilan.**

Working of Pesticides

Pesticides work in the following ways-

- ❖ By blocking the cellular processes of the target organisms in a purely mechanical way e.g., **Spray oils, petroleum oils.**
- ❖ By destroying or altering the pest's metabolism e.g., **Rotenone and cyanide** which disrupt respiratory function in pests.
- ❖ By disrupting enzyme processes or denature proteins e.g. **Inorganic Copper compounds**
- ❖ By simulating or interfering with hormones e.g., **Phenoxy herbicides.**
- ❖ By disrupting photosynthesis and preventing the weed plant from producing or storing energy e.g., **Triazine.**

Benefits of pesticides

- They are used in public health programmes to control vector born diseases
- They are used to protect the stored food grains.
- They protect the standing crop in the field. They do not increase the crop yield like fertilizer but by protecting the crop from pests.
- They can be used to control household pests.

Hazards of pesticides

1. The pesticide industries cause pollution of soil, water and air. The pesticidal residue washed along with rain water, is added to the nearby water resources making it unfit for drinking.
2. They enter the food chain chain and cause problem of bioaccumulation or biomagnification.
3. They are not target specific hence also kills non-pest insects. It adversely affect the mechanism of entomophily.
4. Continuous and indiscriminate use of pesticides may develop resistance in insect pest like **superpest** and **superbugs**.

5. They are non-biodegradable and affect the balance of ecosystem.

6. They are highly toxic in nature and if not handled carefully, they can cause serious health problems like cancer, deformities and disease.

7. Accidents in pesticides manufacturing units cause great loss of human life e.g.,

Bolsover(England,1968), Seveso(Italy,1976),

Bhopal Gas Tragedy(India,1984)



The Bhopal Gas Tragedy: Pesticides in our midst

- The worst industrial disaster in the history of the world is related to pesticide production. This Occurred at **Union Carbide Factory in Bhopal, India Dec. 3, 1984.**
- In this incident, **Methyl Isocyanide (MIC)** – an ingredient in the production of the insecticide **Carbaryl**, escaped into the atmosphere killing more than 3,000 people within a few hour.
- The insecticide, **Carbaryl**, itself is a **highly toxic chemical and carcinogen (cancer causing agent) to humans.**
- The tragedy occurred due to lack of adequate safeguards in the storing the chemical and lack of adequate warning to the public.



(Top) Survivors of the tragedy lineup outside the factory awaiting treatment. Pesticides such as Lindane (middle) and Sevin (bottom) are still being stored in unsafe manner in the now abandoned the factory.

Alternative to pesticides

- **Integrated Pest Management (IPM)**- is an effective and environmentally sensitive approach to pest management that relies on a combination of common-sense practices.
- IPM programs use current, comprehensive information on the life cycles of pests and their interaction with the environment.
- These include use of pest resistant or tolerant, predators, and pathogens, use of parasites, summer ploughing, late planting, quarantine measures etc.

Biological control methods- It include the use of living beneficial organisms, called natural enemies to control pests.

- Biological control is an important part of any integrated pest management programme. All insect and mites have some natural enemies.
- Managing these enemies can effectively control many pest. There are three component of biological control- **Importation, Conservation, Augmentation**

Bio-Pesticides

- These are most effective, important and commercially viable because these are inexpensive, cause no pollution and pose no threat to human health.
- It include naturally available agents in nature e.g.-
Viruses-Nuclear polyhedrosis virus
Bacteria-*Bacillus thuringiensis*
Fungi-*Metarhizium, Beauveria*
- It also includes the use of natural extracts obtained from plants and microbes e.g. *Azadiractin* from neem, *Nicotine* from tobacco.

A person wearing a full-body white protective suit, a respirator mask with two filters, and green gloves is spraying a field of green plants with a hose. The background is a blurred metal fence.

IF IT'S NOT SAFE TO
BREATHE.....

...is it safe to
EAT?

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Thank you