

## CHAPTER 3

### INSECT CONTROL II

#### 3.1 CHEMICAL CONTROL OF INSECT-PESTS

Chemical control is the control of insect pests with the help of pesticides.

**Pesticide:** Any chemical, substance or mixture of substances intended for preventing, killing and repelling any pest.

##### 3.1.1 Classification of Pesticides:

Pesticides can be generally classified as:

Insecticides (The chemicals used to control insects)

Rodenticides (The chemicals used to control rodents e.g. Sodium cyanide, Zinc phosphide etc.)

Acaricides (The chemicals used to control mites e.g. Chlorbenzilate, Dicofol, Ethion etc.)

Weedicides (The chemicals used to control weeds)

Fungicides (The chemicals used to control fungi)

##### 3.1.2 Classification of insecticides:

Insecticides may be classified in following four categories

- Mode of entry
- Mode of action
- Chemical nature
- Formulation

###### 3.1.2.1 Mode of entry

###### 1. Stomach insecticides

The insecticides enter into stomach along with food and kill the insect by chemical action. These insecticides are applied on the plants for the control of chewing insects.

###### 2. Contact insecticides

Such insecticides when come in contact with the body of the insects enter the body

through the body wall. These insecticides are applied directly on the insects when they are damaging the crops. These insecticides are used against soft bodied insects.

### 3. Systemic Insecticides

These insecticides are applied through the soil and by spraying. They are absorbed by the roots and other parts of plants and translocated to all parts of plant. When the insects feed on such plants, they are killed. These are best against sucking insect pests and internal plant borers.

### 4. Transleminar Insecticides

These insecticides translocate from one side of the leaf to the other side i.e. these are transported across the lamina. These are very effective against sucking type of insects.

### 5. Fumigants

These insecticides are mostly in the form of solids which give fumes into the air at ordinary temperature. These enter the body of the insects through spiracles. Aluminum phosphide, Methyl bromide are the examples.

#### 3.1.2.2 Mode of action

##### 1. Physical insecticides

These are those insecticides which kill insects through their physical action. The insecticides block the spiracles and cause suffocation and the death of insect. Their action is physical rather chemical e.g. oils.

##### 2. Muscle Poisons

These insecticides affect the muscles of the insects. These insecticides rupture the muscle membrane which increases the oxygen utility and kill the insects by extra ordinary respiration e.g. botanical insecticides.

##### 3. Nerve poisons

These insecticides affect the nervous system of insects and cause their death. Narcotic poisons, Axonic poisons and Synaptic poisons are the examples.

##### 4. Miscellaneous insecticides

- (a) Insect attractants; e.g. methyl eugenol, gyplure, hexaplure etc.
- (b) Insect repellents; e.g. creosote, mercurous chloride, trichlorobenzene etc.
- (c) Insect growth regulators; example are as under

Chitin synthesis inhibitors: The group of insecticides which inhibit the synthesis of chitin (Buprofezin, Benzoyl phenyl urea).

Juvenile hormone mimics: This is the group of insecticides which mimic with the juvenile hormone and affect the hormonal balance. Ultimately the metamorphosis is disturbed (Fenoxycarb, Pyriproxyfen).

Ecdysone agonists: The insecticides bind the ecdysteroid receptors and affect the physiology and biochemical processes (RH5849, tebufenozide).

**Hormones:** The secretions which produced by organisms into their blood and act at a place different from their origin are called hormones.

**Pheromones:** The secretions which are thrown outside the body are called pheromones. Pheromones are used to communicate between individuals of same species.

**Chemosterilants:** A chemosterilant is a chemical used to cause temporary or permanent sterility of one or both of the sexes of insects. The mating of sterilized insects with fertile insects produces no offspring and if the number of sterile insects is kept constant, the percentage of sterile insects will increase and fewer off springs will be produced in each successive generation. Types of chemosterilants are antimetabolites and alkylating agents.

### 3.1.2.3 Chemical nature

On the basis of chemical nature, the insecticides are classified on following types.