

PCP 201: PRINCIPLES OF CROP PRODUCTION I
LECTURE NOTES ON INSECT PESTS OF CROP PLANTS

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INSECT PESTS OF CROP PLANTS

Meaning of crop Pests: A pest can be described as any organism capable of causing damage to crop plants.

Types of Crop Pests

1. Insects
2. Birds
3. Rodents
4. Monkeys
5. Man
6. Nematode

Classification of Insect Pests

Insect pests can be classified into various groups based on their mode of feeding (feeding habits) as follows:

- a. Biting and chewing insects
 - b. Piercing and sucking insects
 - c. Boring insects
- a. Biting and chewing insects

These possess strong mandible and maxillae (mouth parts) which enable them to bite and chew. Examples are: termites, grasshoppers, leaf worms, army worms, mantids, locusts, crickets and beetles

- b. Piercing and sucking insects

The insects possess strong mouth parts called proboscis which enable them to pierce through plants and suck liquid materials from plant tissues. Examples are: aphids, cotton stainers, mealy bugs, scale insects, white flies, mites and capsids.

- c. Boring insects

These bore into plant parts and destroy the tissues of the plants or fruit or seeds. Examples include: bean beetle, stem borers, maize weevils, rice weevils.

ECONOMIC IMPORTANCE OF INSECTS PESTS

1. Insects pests destroy crops in the field through their biting, chewing, boring sucking and defoliation activities.
2. They cause reduction in viability of stored produce.
3. Spot of injuries by insects may predispose crops to disease attack.
4. They increase the cost of production during the course of controlling them.
5. They render vegetables and fruits unattractive and unmarketable.
6. Some are carriers or vectors of diseases.
7. The profits of farmers are reduced.

8. They reduce the quantity of produce either in store or in the field
9. They generally reduce the yield of crops.
10. They can also cause total death of crop plants.

Prevention and control of Pests

Pests of crops can be prevented or controlled through the following methods

1. Physical control
2. Cultural control
3. Biological control
4. Chemical control

1. Physical control

This involves the physical removal of pests by

Handpicking of insects and larva

- ii. Setting of traps to catch rodents
- iii. Shooting rodents with guns
- iv. Fencing round the farm with wire nets

2. Cultural control

This involves the use of farm practices to prevent or control pests especially on the field.

Examples of cultural control

Practice of crop rotation.

- ii. Use of pest resistant varieties of crops.
- iii. Appropriate tillage operation
- iv. Use of insect traps
- v. Hand-picking and destruction of insects
- vi. Burning crop residues
- vii. Timely planting of crops
- viii. Proper weeding or sanitation
- ix. Timely harvesting
- x. Close season practices especially in cotton

3. Biological control

This involves the introduction of the natural enemies of pest to control or keep the pests population under control. Such enemies eat up or feed on these pests e.g *Epidinocarsis lopezi*

4. Chemical control

This involves the use of chemicals called pesticides to control pests of crop plants. Examples of chemicals used to control pests:

Pesticides- chemicals to control pests

- ii. Insecticides- chemicals to control insects
- iii. Rodenticides- chemicals to rodents
- iv. Avicides- chemicals to control birds
- v. Nematicides- chemicals to control nematodes

5. Integrated control

This involves use of two or more of the above methods. This type pest control is more economical and more effective.

Side effects of chemical method of control

- i. Some beneficial insects and soil organisms may be destroyed
- ii. The chemical used may be toxic to man and domestic animals
- iii. It may leave undesirable residue in the environment.
- iv. Pests and diseases may develop resistance to chemicals.
- v. Some are washed out of soil to rivers and streams where they can endanger aquatic life and cause pollution.
- vi. Empty containers may be a source of poisoning when used as containers for consumables.

Side effects of biological method of pest control

The new organism introduced may start attacking crops which were originally free from attack.

- ii. The predators expected to control others may rather feed on beneficial insects
- iii. The activities of the new organism introduced may cause serious imbalance in the ecosystem

Side effects of cultural method

The use of fire to kill harmful pests may also result in destruction of other beneficial organisms.

- ii. Resistant varieties may become adapted to the environment so that the resistance is short-lived where is used.
- iii. If care is not taken fire may spread to other unintended places and farms.
- iv. The use of fire may cause the destruction and loss of organic matter from the soil.
- v. It may lead to destruction of soil structure and cause soil erosion.

COMMON STORAGE PESTS AND THEIR CONTROL

Different pests have been identified with farm produce some of which are found to be of economic importance even after such crops have been harvested and stored. This applied to both fruits and grains.

Examples of some common storage pests of grains

- Maize weevils – *Sitophilus zea mays*
- Rice weevils – *Sitophilus oryzae*
- Bean beetles – *Calosobruchus maculates*

Some common methods of controlling pests of stored produce

Fruits crops:

The use of low temperatures by storing in refrigerators or cold room has proved effective. Drying is also helpful to preserve some fruits from pest damage: tomato, pepper, okra etc.

For grains

Storage under dry condition with the grains dried to about 14% moisture content

Storage under cool conditions in cold room has helped to maintain seed viability or storability

Storage in air in tight conditions at moisture content of about 14% in drums or even Jerry cans have been used over time.

Storage in jute bags with polythene inside and some tablets of phostoxin (Aluminum phosphide 57%) stored in a dry condition outside living room has proved efficient

Read up methods for storing

- Yam
- Groundnut