Plant Protection Measures

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Plant Protection

Weeds + Insects + Diseases

Plant Protection

- **Definition**: Various measures adopted to control or reduce insects, disease or weeds pressure on crop plants

Measures or Methods used for protection

1. **Cultural or Indirect Measures**
2. **Chemical Control or Direct Measures**

Cultural or Indirect Measures

Healthy and clean seeds

- Wheat seeds may carry fungal spores of loose smut spores.
- Cotton seeds should be sundried before sowing to kill larvae of pink worm in seed shell.

Sowing time

- Wheat sown in 3 or 4 week of October is heavily infested with flag smut.
- Cotton sowing in April or June remain safe from wilt or root rot compared to crop sown in May.
- Gram wilt can controlled by delayed sowing.

Cultural or Indirect Measures

Sowing method

- Sowing of rice through nursery can check borers and disease attack.
- Optimal planting geometry of cotton facilitate air circulation and light penetration which check aphid, jassid and white fly.

Fertilizer and irrigation

- Timely application of fertilizer and irrigation create resistance against insect and disease attack in plants.

Cultural or Indirect Measures

Mixed sowing

- Mixed sowing of wheat and gram can reduce the fungal attack of gram as wheat act as barrier for spores.
- Sowing of moth in cotton can check cotton wilt or root rot.

Field sanitation or clean farming

- Fields should keep free from weeds and crop residues may act as alternative hosts for dieases and insects.

Cultural or Indirect Measures

Resistance varieties

- Cotton varieties with rough and hairy leaves less attacked by sucking insects.
- Stiff stem sugarcane (BL-19) is less affected by borer and wild boar / rats.

Removal of diseased plants

- Plants of sugarcane affected by smut and red rot, spikes of wheat with loose smut should be removed.

Harvesting

- Crop must harvest near soil. Stubbles of rice, sugarcane, maize and cotton should be ploughed.

Cultural or Indirect Measures

Ratoon crop

- Ratooning of sugarcane avoided if sever attack of red rot or borer.

Burying and burning of stubbles

Crop rotation

- Crop rotation discourage accumulation of insect and diseases. When host plant not present in field parasite will starved to death.

Advantages of Cultural Measures

- No need of pesticides, machinery and technical guidance.
- Harmless.
- No damage to beneficial insects.
- Insects are controlled in pupa or larvae stage and hidden in stubbles.

Advantages of Chemical control

- Quick and complete
- Economical
- Time saving
- Less laborious

Classification of Insecticides

Classification of Insecticides

Chlorinated Hydrocarbons

- Chlorine, hydrogen and carbon are constituents.
- In addition to these some have oxygen and sulphur
- Mode of action: reaching insect stomach on chewing or swelling or by contact action.
- Corrode the skin, paralyse nervous system by interring blood.
- Examples: DDT, BHC, Heptachlore, Endrin, Eldrin
- Suitable for grasshoppers, cutworms, army worms, toka etc.

Classification of Insecticides

Organophosphate

- Phosphate is a principal constituent.
- Suitable for sucking type of insects Aphids, Jassids, Whitefly, Mites etc.
- Group is sub-divided into:

A. Systemic Organophosphate:

- Absorbed by leaves after spray, enter into vital fluid and reach everywhere in plant.
- Insects are killed when suck the sap or chew leaves parts.

Classification of Insecticides

Examples of Systemic Organophosphate:

1. Dimethoate
Rogal, Perfekthain, Ciagon, Sistoet.

2. Methamidophos
Sundaphos, Master, Monitor, Timaron

3. Fenothoat
Cidel, Elsan

Classification of Insecticides

A. Examples of Systemic Organophosphate:

4. Endosulfan
Thiodan, Thioluxan.

5. Phosphamidan
Dimecran, Pilarwan

6. Diazinon
Diazinon, Basudin

Classification of Insecticides

B. Non-Systemic Organophosphate:

- Absorbed by leaves or tissue after spray, but not translocated.
- Insects are killed when suck the sap or chew leaves parts.

Examples of Non-Systemic Organophosphate:

1. Monocrotophos
Nuvacron, Pillardin, Nokout, Monophos, Suncrotophos.

2. Milothian
Ematos

Examples of Non-Systemic Organophosphate:

3. Methaacerephos
Nogas, Phostac.

Classification of Insecticides

Carbamates

- Carbolic acid is a basic ingredient.
- Absorbed through stem
- Suitable for Maize, rice, sugarcane borers.
- Available in granules or dust form.

- Examples: Thimet, Padan, Furadan, Curator, Primos, Acalex, Seven dust and Linate dust.

Classification of Insecticides

Pyrethrouid

- Absorbed through leaves and kill through contact action.
- Systemic, very rapid.

Examples of Pyrethrouid:

1. Cypermethrin
Arivo, Cymbush, Nurale, Shurpa.

2. Permethrin
Ambush, Permasect.

Examples of Pyrethrouid:

3. Finolret
Sumicidan, Funkil.

4. Phenophthrin
Dinitol.

5. Ciflomethrin
Bythroid.

Examples of Pyrethrouid:

6. Bifinthrin
Talstar.

7. Deltamethrin
Decis.

8. Flovelent
Mevrik.