

CROP PROTECTION

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Crop protection is the science of managing plant diseases, weeds and other pests that damage agricultural crops and forestry.

Pest: A pest is an organism that at any given time or place is undesirable.

Disease: It is any condition of a plant that interferes with its normal structure, and functions or economic value.

pests and diseases have been grouped together and redivided into two new groups.

Parasitic pests and Diseases

- Insects
- Snails (Shelled gastropods)
- Vertebrate pests (Birds, mammals, reptiles, Rabbits, Foxes, wild dog etc.)
- Nematode diseases (Root knot nematode galls)
- Virus diseases
- Bacterial diseases
- Fungal diseases
- Parasitic flowering plants (Cuscuta sp.)

Non-Parasitic pests and Diseases

- Living agents (plants & animals) which damage plants mechanically

on plants e.g

Insects: leafcutting bees, Soldier beetle.

Fungi: Lichens, (create nests)

Animals: cats, dogs, earthworms and humans

Weeds: Weeds also come within this group but because of their importance and number are studied as separate group.

Non-living agents

Non-living agents are the largest group, non-parasitic pests which are infinite in number and type. These include:

- Environmental agents e.g heat/cold, drought, waterlogging etc.
- Nutrient deficiencies and toxicities.
- Acid soils
- Salinity
- pollution or pesticide injury.
- Mechanical injuries
- Genetic abnormalities.

CONTROL METHODS

Indirect Control Measures

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of pest e.g. Flea beetle, fruit fly. Early planting of Broccoli advances plant maturity before flight peaks.

3. Cultivation

Ploughing exposes pests such as caterpillars which are then eaten by birds.

4. Encouragement of plant growth: Good quality seed should be used which will germinate quickly & evenly. A poor growing crop is more vulnerable to pest attack than a quick growing crop.

5. Clean Farming / Removal of alternate host
Weeds are alternate host to a great variety of insects and these sources of infestation should be eradicated.

DIRECT CONTROL METHODS

This means chemical control of insect, pests and diseases with the use of inorganic chemicals that are toxic to certain categories of pests.

Biological Control

In this method a parasite or predator is used to control the pest.

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Problem Soils / Problems of Land Resources of Pakistan
Salt affected soils -
Sir. Akse Aziz

In these soils, the soluble salts accumulate in such proportions that they affect crop production ability of soils.
In Pakistan 7.617 mha land is saline

Salt affected soils are of three types
Cations = Na, Ca, Mg Anions: Cl⁻, Sulphate & bicarbonate
1 - Saline Soils: - lowe = potassium, nitrate & carbonate

These soils contain excessive quantities of soluble salts which show up on the surface of the soil as white crust. Salts from the lower soil depths move to the surface with the upward movement of water. These soils are called white alkali soils or Kallar soils, thar or shor soils

pH is less than 8.5

EC = 4 m mhos/cm or more

ESP = Exchangeable sodium percentage = less than 15

2. Saline-Sodic Soils

These soils contain soluble salts and exchangeable sodium in excessive quantities which interfere with the growth of most crop plants.

ESP = 15 or more

EC = less than 4 m mhos/cm

pH = less than 8.5

Sodic soils instead of normal soils.

Sodic Soils

In these soils the proportion of sodium ions associated with the surface of fine clay particles exceeds 15 percent. Locally these soils may be called "Borr soils" or Rakkar Soils. The presence of sodium on clay particles breaks up the aggregation of soil particles. Thus the soil loses its tilth and becomes very sticky when wet & hard when dry

- Difficult to reclaim
- water stands on soil for long time after rain
- pH = 8.5 to 10.5

EC = less than 4 mmhos/cm

ESP = > 15

organic matter may disperse and may move to surface of soil with water imparting a dark colour to the soil. Such soils are also termed as black alkali soils.

Water logged Soils.

These are the soils in which water reaches within 0 to 1.5 m depth of soil. or Water table came close to the surface of soil create water logged conditions that adversely affect agricultural productivity.

→ Greater evaporation from high water table soil result in accumulation of salts in the root zone of the crop.

The seepage of water from the unlined canals causes waterlogging - This also cause salinization of the soil

Deterioration of soil structure, poor aeration, warmer temperature reduced nutrient uptake, low organic matter content

- ① Seepage drain ② Lining ③ Canal closure ④ planting trees ⑤ Drainage.

Soil Erosion :- It is the detachment and transportation of surface soil material with water or wind. As top 12-22 cm soil layer is the principal feeding zone of most of the agricultural crops, its removal makes the soil less productive

Two main agents of Erosion

- i) Water erosion
- ii) Wind erosion

Water erosion is common in northern uplands of the country

Wind erosion is common in arid and semi-arid areas in the South.

About 1.4 m ha are affected by erosion in Punjab alone.

Protective measures 1. Contour Farming 2. Strip cropping 3- Keep the ground covered for major part of the year.