## BREEDING FOR INSECT RESISTANCE

Most important because many crops are affected by insects. For E.g. Cotton is attacked by more than 160 species of insects of these a dozen are major pests. The necessity for resistance breeding are.

i) Environmental pollution prevention
ii) Higher costs involved in spraying.
iii) Death of beneficial predators and parasites.
iv) Building up of resistance - E.g. Pyrethroid

**Mechanism of insect resistance** : Painter (1951)

1. Non preference
2. Anti biosis
3. Tolerance
4. Avoidance.

**Non preference** : Non acceptance or Antixenosis

Un attractive or unsuitable for colonization, Oviposition or both by an insect pest.

Aphid resistance in raspberry. It involves various morphological and biochemical features of host plants.

**Antibiosis** : Adverse effects caused by the host to an insect feeding on it. It may hinder the development, reproduction or in some cases death also. The antibiosis may be either.

i) Morphological
ii) Physiological
iii) Biochemical features of the host plant. E.g. Gossypol content in cotton.

**Tolerance** : Able to tolerate the attack, withstand and give yield.

**Avoidance** : Insects avoid certain plants. Early maturing cotton varieties escape pink bollworm. Sorghum early lines escape shoot fly attack.

**Nature of insect resistance :**

1. **Hairiness** : Hairiness of leaves is associated with resistance.
   Jassid resistance - cotton.
   cereal leaf beetle -

2. **Colour of plant** : Induces non-preference for oviposition.
   Red cabbage - Lepidopteran
   Red colour Cotton - Boll worms.

3. **Thickness of plant Tissue** :
   Cotton - Jassid resistance. Dense thick leaves - It is more of mechanical obstruction.

4. **Presence of Silica in plant body**
   Shoot fly resistance in sorghum - Damage to mandibles.

5. **Biochemical factor**:
   Gossypol content
DIMBOA content in leaves.
(Bio chemical) - Stem borer in maize.

6. **Physiological factors**
   Osmotic concentration of cell sap, cell exudaters etc.
*Solanum* sp - Gum exudate - Aphids are trapped in it.

**Genetics of Insect resistance:**

1. **Oligo genic** Monogene 3 : 1
   Jassid resistance Cotton Wheat rust resistance Green bug resistance
2. **Poly genic** More durable Wheat cereal leaf beetle resistance.
3. **Cytoplasmic** Plasmogenes
   European corn borer in maize.

**Sources of resistance:**

1. Cultivated variety - TKM 6 Rice
   Stem borer resistance
2. Germplasm Collection
3. Related Wild species -

*S.nitidum* - shoot fly resistance - Sorghum
*G.anamalum* - Jassid resistance - Cotton

**Screening technique :**

**a) Field condition :**
i) Infector rows are planted at regular intervals
ii) Testing in areas where ever the pest is recorded as endemic area.
Ground nut leaf miner - Aliyarnagar.
iii) Seasonal testing when insect population is most.
iv) Rearing the insect in lab and releasing them in fields. Or by transferring equal no of eggs of larvae to each plant.

**b) Glass house Screening** :
Raised in cages and definite number of larvae are released in the cage.