Insecticides as component in IPM

a. **Physiological selectivity**

b. **Ecological selectivity**

c. **Behavioral selectivity :Time dose formulation**

a. Physiological selectivity

- **Use of juvenoids, on the developmental stages to prevent metamorphosis**
- **Use of cuticle synthesis inhibitors to prevent cuticle deposition in the larvae**
- **Use of microorganisms like *B. thuringiensis* and nuclear polyhedrosis**

b. Ecological selectivity

- Life cycles of major pests.
- Use of minimum effective dosage of insecticides not only effect target species but also survival of natural enemies.

c. Behavioral selectivity

- Knowledge of habits and behavioral differences among pest and natural enemies helps in reducing the amount of insecticides.

Integration of insecticides with other control methods

- **Insecticides can be integrated with biological control, resistant cultivars and cultural control.**
- **Insecticides afford only curative control measure for insect pest populations at economic threshold level.**
- **Insecticides have rapid curative action in preventing economic damage.**
- **Insecticides offer a wide range of properties, uses and methods of application to pest situation.**
- **Benefit/ cost ratio for insecticide use are generally favorable.**

Benefits of pesticides

- **Effective and reliable against a wide variety of pests.**
- **Quick acting—when a problem reaches economically damaging proportions, pesticides can provide a rapid cure.**
- **Economical when used properly.**
- **Easy to use.**
- **Easily tested—for new pests, it is easier to test and incorporate pesticides in a control program than to develop resistant varieties or import natural enemies.**

Risks of pesticides

- Pest may develop resistance to the pesticide.
- Injury to applicator and others.
- Impacts on non-target organisms, including natural enemies of pests, pollinators, wildlife, and plants.
- Environmental contamination, such as residues in food and water.
- Safety hazards in production, transportation, and storage.

Role of insecticides in IPM

Within the IPM framework:

- **Should be used only to avoid predictable economic damage – with the most effective techniques. At correct time and at optimum dosage.**

- **Second, insecticides should be integrated with other control methods when alternative methods cannot keep pests in check.**

- **Third, socioeconomic aspects of insecticide use must be considered.**

Practical perspective

- I –integral
- N – Necessary ‘evil’ ?!
- S - Sole (earlier) but now ‘special’
- E - Economical
- C – Curative
- T – Time tested
- I – Implementable
- C – Critical (in times of outbreaks)
- I – Income fetching (Higher B;C Ratio)
- D – Deadly
- E - Effective