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Mechanical Methods of Insect Pests Control

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Mechanical control of pests is an integral part of a successful Integrated Pest Management plan. Use of mechanical procedure to eliminate or reduce pest population. Mechanical control kill a pest directly or make the environment unsuitable for it.

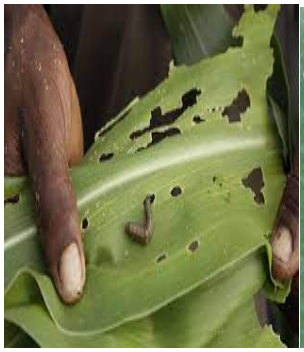
Mechanical Methods

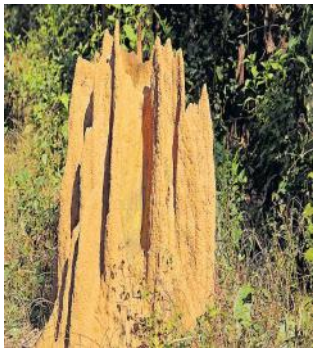
Mechanical methods bring about reduction or suppression of insect populations by means of manual devices, viz., hand picking, exclusion by screens and barriers, trapping and suction devices, use of hand-nets and bag-nets, clipping, pruning and crushing, beating and hooking, shaking or jarring, sieving and winnowing, and burning or The use of hands on techniques as well as simple equipment, devices and natural ingredients that provide a protective barrier between plants and insects.

1. **Handpicking**: Handpicking and destruction of egg masses, large sized, conspicuous, immature or mature stages of insects is most ancient method which can prove fairly effective under certain conditions.

Examples:

- In sugarcane top shoot borer (*Scirpophaga nivella*) endemic areas, collection and destruction of egg masses in first and second brood during March and May in ratoon and autumn planted crops reduces the damage.
- The collection and destruction of egg masses and gregarious early larval instars of polyphagous pests *Spodoptera litura* and hairy caterpillars reduces the damage.
- In cotton, manual removal and destruction of rosette flowers(pink bollworm, *Pectinophora gossypiella*), flared up squares, stressed and drooped terminals (American bollworm, *Helicoverpa armigera*), withered and drooped terminals (spotted bollworm, *Earias vitella*), leaves with egg masses or young instar larvae (tobacco caterpillar, *Spodoptera litura*) reduces the bollworm incidence and damage.
- Collection and destruction of fallen fruits is effective against fruit flies and fruit borers.
- Destruction of termite mound.

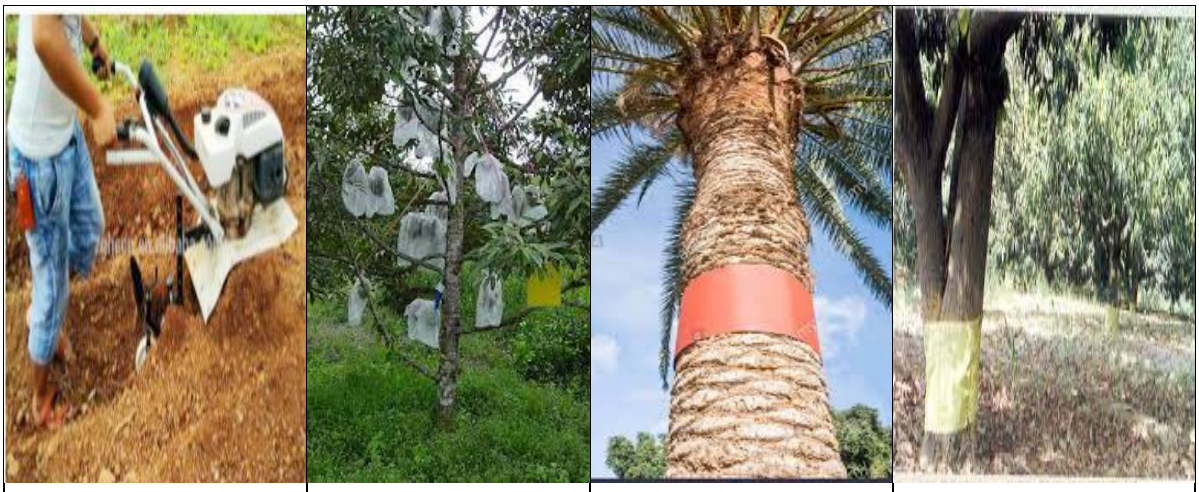


Handpicking of larvae	Collection and destruction of egg masses	Collection and destruction of fallen fruits	Destruction of termite mound

2. Provision of preventive barriers:

- **Trenches:** The pests like locusts and red hairy caterpillar (*Amsacta albistriga*) move in groups from one field to other and cause damage. It can be prevented by digging trenches of 30 -60 cm wide and 60 cm deep around the fields, the larvae fall in the trenches and can be easily destroyed by burying with soil.
- **Bagging or wrapping:** The pomegranate butterfly *Virachola isocrates* and mango fruit fly *Bactrocera dorsalis* lay their eggs on tender fruits. Larvae after hatching bores into the fruit and entry hole heal up. The fruit appears healthy but the caterpillar inside feeds on pulp and seeds just below the rind. The infestation can be prevented by bagging or wrapping of pomegranate and mango fruits with polythene or paper bags or cloth bags soon after the fruit set.
- **Tin or metal band:** Coconut rat (*Rattus rattus wroughtoni*) enters crowns and burrows into immature nuts and the attacked nuts will be shed. This can be prevented by fixing of 18" tin bands over coconut palms at least 4ft up the trunk (rats can jump upto 3ft), the metal band keeps out the rat claws from sinking into the bark and hinders their ability to climb.
- **Sticky and slippery band:** The adult female mealybug (*Drosicha mangiferae*) lays eggs in soil at 5-15cm deep during April and May which hibernates till November. The eggs hatch during November- December. The nymphs ascend the trees and suck sap from inflorescence, fruit stalks, fruits etc. leading to flower drop, pre mature fruit drop etc. This can be prevented by wrapping of 25 cm wide, 400 guage polythene sheet on the tree trunk 30 cm above ground level and smearing grease over it to prevent migration of freshly hatched first instar nymphs during winter (Nov-Dec) from soil to trees due to the sticky and slipperiness of grease. Crawlers collecting beneath the polythene sheet can be scraped with a knife.

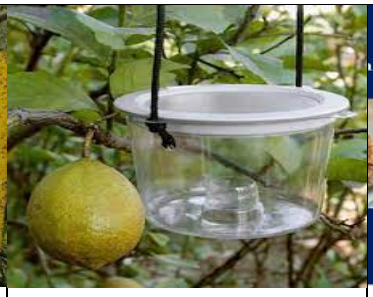


Trenches	Bagging	Metal band	Sticky band

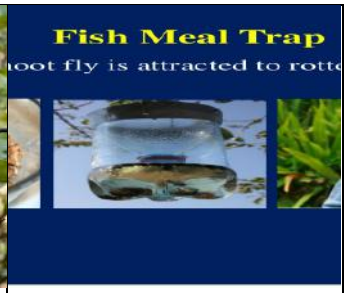
3. Trapping and suction devices:

- **Yellow sticky trap**: Cotton whitefly (*Bemesia tabaci*), and aphids (*Aphis gossypii*) prefer yellow colour. Yellow colour is painted on tin boxes and sticky material like castor oil or vaseline is smeared on the surface. These insects are attracted to yellow colour and trapped on the sticky material.
- **Bait trap**: Attractants placed in traps are used to attract the insect and kill them.
- **Fishmeal trap**: This trap is used against sorghum shootfly (*Atherigona soccata*). Moistened fish meal is kept in polythene bag or plastic container inside the tin along with cotton soaked with insecticide (DDVP) to kill the attracted flies.
- Picking of adult rhinoceros beetle (*Oryctes rhinoceros*) from the holes on crown of coconut trees with the help of crooked hooks made of iro

Yellow sticky trap



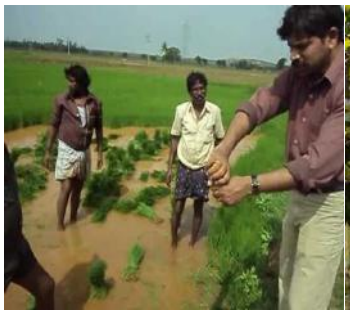
Bait trap



Fishmeal trap

4. Clipping and Pruning

- Clipping the tips of the paddy seedlings prior to transplantation aids in the elimination of egg masses of yellow stem borer (*Scirpophaga incertulas*) and grubs of Hispa (*Dicladispa armigera*) and reduce the carryover of infestation from nursery to main field.
- The management of mustard aphid (*Lipaphis erysmi*) is done by clipping and destruction of infested twigs. The clipping is done three times at 15 days interval starting with the colonisation by the aphids.
- Pruning and destruction of infested of floral parts (Scales, mealy bugs in grape, citrus, ber, fig, custard apple and *Leucinodes orbonalis* in brinjal)



Clipping

Pruning

5. Shaking of plants

Spreading of gunny bags on the ground below the plants or trees and by systematic shaking of plant or tree the insects dislodge and fall on the gunny bags, they can be collected and destroy by burning in fire.

Example:

- Systematic shaking of root grub adults harboured trees during evening hours to dislodge and destroy by dumping in fire.
- Shaking of red gram plants to collect and destroy later instars of *Helicoverpa armigera*.

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