

## **PRACTICAL 5:**

### **INDIGENOUS TECHNOLOGY KNOWLEDGE :**

*The integration of scientific and traditional knowledge would help to develop technologies which are need based better problem solving ,locally available easily acceptable ,cost effective ,convincing and credible to the rural client collectively. Most ITKs were based on the local availability of material and human resources to ensure minimal livelihoods for local people.*

#### **ITK IN PEST MANAGEMENT:**

*In general the ITKs are based on three categories viz.,*

*(a) Cultural practices: The cultural practices (field sanitation; proper seed and variety selection; proper seedbed preparation; planting date; row spacing; seeding rate; fertilization; water management; crop rotation; planting of trap crops and hedge rows; companion planting; and intercropping) contribute to prevent, suppress, or eradicate pest build-up by disrupting the normal relationship between the pest and the host plant and thus make the pest less likely to survive, grow, or reproduce. Most of these practices are well experimented and practiced by the farmers. However, some strategies to grow ground cover crop and windbreaks are required to reduce dust because dust can interfere with natural enemies and may cause outbreaks of pests such as spider mites.*

*(b) Physical and mechanical methods: It includes proper land preparation; hoeing; weeding, bagging of fruits; baits and traps; row covers; mulching; handpicking; and pruning, etc. Among the above practices traps and baits can be indigenously prepared using locally available resource for better monitoring and control of insect pests. Few examples are:*

#### **PHYSICAL METHODS-**

*Trapping rhinoceros beetles (RB) in coconut: a mud pot with three quarters of it is to be filled with water and to this 250 g of powdered castor cake is added. The pot is then buried in the soil with its mouth in level*

with the soil. The smell of the cake attracts the beetles which fall into the water. Just 2-3 such pots in one hectare of plantation can clear beetles from the area. Slices of pine apple are also used to attract RB. In a cylindrical plastic container 2 slices of pineapple are taken and an exit hole is made to allow the rain water to drain. The trap is hung near the crown of the coconut tree. The beetles are attracted to wards the pineapple and get trapped.

**Trapping fruit flies:** Fruit fly (*Dacus dorsalis* and *D. cucurbitae*) incidence is normally seen in mango and cucurbits. A low-cost fruit fly trap to combat this insect pest can be made as follows;

(a) 20 g of *Ocimum sanctum* (holy basil) leaves are crushed and the extract along with the crushed leaves are placed inside a coconut shell, which is then filled with 100 ml water. To increase the keeping quality of the extract, 0.5 g citric acid is added and the extract is then poisoned by mixing 0.5 g carbofuran 3G. The traps are suspended from mango tree branches at a rate of 4 traps per tree. The fruit flies feed on the ocimum extract and are killed.

(b) Make a trap using a 2-liter disposable water bottle: Two holes at a height of 5cm from the bottom of bottle are made and for hanging the trap, use a string which is pushed through a hole drilled in the centre of the cap from inside. The attractant mixture for fruit flies is then prepared by mixing 1 cup of vinegar, 2 cups of water and 1 tablespoon of honey and shakes this well before use. Fill the trap with this mixture up to the level of holes and hang the container about 5 feet high. Flies will enter the container and fall into the attractant.

**Trapping sucking insect pests:** Bright yellow sticky traps are used for monitoring/controlling aphids, thrips and whiteflies. While, bright blue traps can exclusively be used for monitoring thrips and bright white sticky traps for flea beetles (Bissdorf, 2008). Set up sticky traps for monitoring whitefly, thrips etc. @ 10 traps per ha. Locally available empty tins can be painted yellow / coated with white grease / vaseline / castor oil. Place traps near the plants,

preferably 25 cm away from the plant to ensure that the leaves will not stick to the board, but not facing direct sunlight.

### **MECHANICAL METHODS-**

**Bait for Ant:** The bait can be made by dissolving 1 teaspoon powdered boric acid and 10 teaspoons sugar into 2 cups of water; this mixture can then be absorbed into cotton balls which are left near ant trails.

**Gundhi bugs in rice:** Fix dead crabs, frogs or even pieces of jackfruit (*Artocarpus heterophyllas*) to bamboo sticks and place them in rice fields before milky stage. This will attract gundhi bugs and keep them busy till the dough stage is over.

**Rats:** Boil 10 kg of wheat seeds in water with two large pieces of the bark from the *Gliricidia* tree. Then use the boiled wheat seeds in the field or in stores where rat menace exist. *Gliricidia* is a rat killer as it contains coumarin which gets converted to anticoagulant dicoumerol by bacterial fermentation. This reduces the protein Prothrombin to cause death in rats due to internal bleeding.

(c) **Use of botanicals:** Botanicals are readily available than commercial products as they grow in the local environment.

**Coriander (*Coriandrum sativum*) for spider mite control:** Coriander acts as a repellent and to prepare the extract boil 200 grams of crush seeds in 1 liter of water for 10 minutes. Dilute extract with 2 liters of water. Spray early in the morning on infested plant parts to control spider mites.

**Turmeric (*Curcuma domestica*) :** Soak shredded rhizome (20g) in 200ml cow urine. Dilute the mixture with 2-3 liters of water and add soap (8-12 ml) and spray. The extract controls aphids, caterpillars, red spider mites and powdery mildew.

**Neem leaf extract:** Pound 1kg neem leaves and place it in a pot with 2liters of water. Cover the mouth with cloth and leave it as such for 3 days. Dilute the extract at 1:9 with water and add 100 ml of soap before spraying. This controls aphids, grasshoppers, leaf hoppers, plant hoppers scales thrips

*weevils and beetles.*

***Other pest control formulations based on ITK:***

*Fermented curd water - In some parts of central India fermented curd water is used for the management of white fly, jassids aphids etc.*

*Cow milk: Cow's milk was reported to acts as an excellent sticker and spreader due to presence of casein protein has excellent spreader and sticker property. It can be used @ 10% aqueous suspension for effectively controlling powdery mildew.*

*Cow urine: Cow urine have been found effective against mealy bugs, thrips and mites and against post flowering insect pests of cowpea.*