Pest control

1 Preventive practices

Prevention of pest outbreaks is important to:

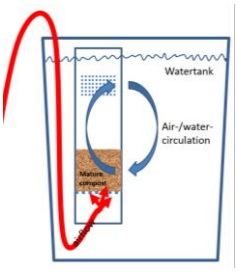
- Save costs
- Prevent negative impacts of some curative methods on the farm ecosystem.

There are two steps of preventive measures: **crop-management & habitat-management practices.**

1.1 Crop management practices

Aim to improve crop health (and thus resilience and resistance), by providing good growing conditions. Examples are choice of appropriate varieties, timely planting, proper spacing, water conservation, and:

Good soil care
Use of self-produced compost tea supports a healthy soil life which helps to grow more resilient plants



Balanced nutrient management
Do not overfertilize your plants; it makes them more attractive to pests & diseases

1.2 Habitat management practices

Aim to promote natural enemies and reduce proliferation of pests. Important measures are:

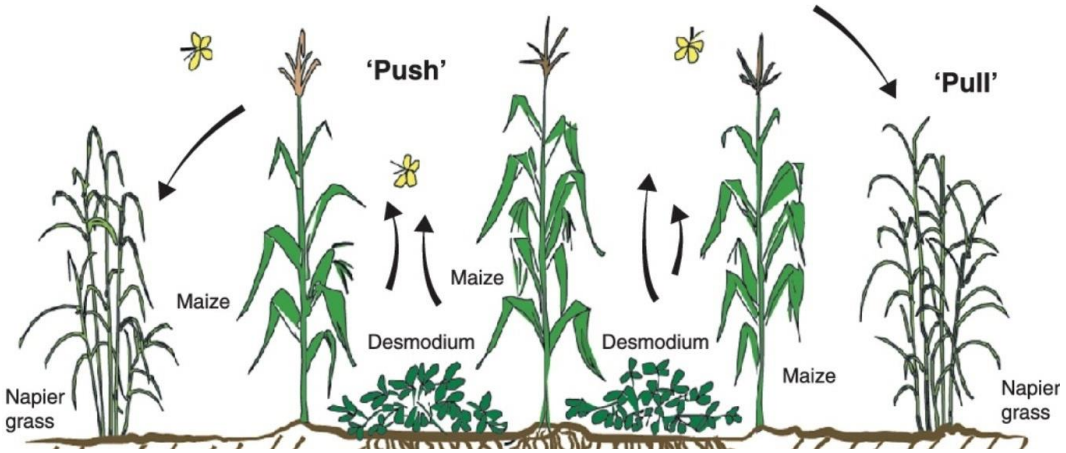
Cover crops
are crops planted in between trees or commercial crops, to cover bare soil. Cover crops help against pests in multiple ways:

- Giving shelter to beneficial insects and insectivorous animals
- Increasing resistance by reducing stress from weather conditions or shortage of water & nutrients
- As push-pull plants: see the example below

Field hygiene
Remove infected plants & overripe fruits to break the reproduction cycle of pests. The removed parts can be used as compost material, if the heap is hot enough (65 ^{O}C)

Push-pull system in maize against maize stemborer

- Desmodium serves as 'repellent crop':
  it is planted in between the maize and drives the pest out of the maize field ('push')
- Napier grass serves as 'trap crop':
  it is planted next to the maize field and attracts the pest, away from the maize ('pull')



Pest control

2 Curative practices

In case of heavy pest outbreaks, direct control is needed to minimize losses. There are multiple options:
- Biological control agents
- (Self-made) insecticides from natural origin, including plant extracts
- Insect traps, see the two below.

As these measures can also kill beneficial insects, they should be applied with care.

2.1 Sticky cards

= coloured, plastic cards coated with glue to attract and trap insects.

Two purposes:
- Monitoring: to early detect pest outbreaks.
  Use 3-4 cards per 1000 sq. ft (~100 m^2)
- Trapping: to catch pests.
  Use 1 card per 20-50 sq. ft (~2-5 m^2)

Different colours attract different pests:
- Yellow: winged aphids, whiteflies, leafminers, leafhoppers, fungus gnats and general insects
- Blue: thrips

How to make sticky cards:
- Find a yellow or blue plastic card
- Attach the card to a wooden stake with a clothespin
- Cover the surface of the card with a non-drying glue or grease

How to use sticky cards:
- To monitor insect populations, check the cards weekly
- Use a 10-20x handlens to identify insects on the cards
- Change the cards when they get dirty (weekly)

Placement:
On a branch at fruit height in fruit trees

Vertically, just above the canopy for general use. Move up as plants grow.

Horizontally above the soil against fungus gnats

Note:
- Mites, mealybugs, scales, wingless aphids and immature stages of thrips and whiteflies do not fly and will not be caught on the sticky cards.
- Yellow cards will also attract beneficial insects (wasps, flies). Carefully observe if the traps are not catching large numbers of beneficial insects

Pest control

2.2 Bottle traps

= self-made trap of a plastic bottle, catching insects using bait, for example fruit flies and coddling moth

How to make a bottle trap:

1. Find a plastic bottle and cut of the top.

2. Remove the cap

3. Reverse the top and glue it to the bottom part.

4. Attach a wire and add bait

5. Hang the trap in a tree

Bait:
- Equal parts sugar and vinegar + soapy water (good in cherry, pear, apple)
- Cattle urine/fruit flesh/small dead fish + soapy water (fruit flies)

Placement:
- Hang in a tree where flies are seen
- 1.5-2 m above the ground, or where fruit develops
- Try to find a place in the shade
- Put traps no more than 5-6 metres apart

Note:
- Experiment which bait works best for you
- Replace the content of the trap weekly and add more liquid if the trap dries out
- When fruit ripens and sweetens, baits become ineffective; place the traps before fruiting