



CROP PROTECTION

COMMON BACKYARD VEGETABLES

- Leafy (Pechay, Mustasa, Lettuce, Kangkong)
- Tomato
- Eggplant
- Pepper
- Okra



DAMPING OFF

- **CAUSAL AGENT**

- Oomycete (*Pythium spp.*)



- **CONDITIONS FOR DISEASE DEVELOPMENT**

- Cool, wet soils, overwatering, poor drainage, excessive use of nitrogen.

- **MANAGEMENT AND CONTROL**

- Sterilize seedling trays with 10% household bleach.
- Use sterilized soil media
- Regulate watering



CERCOSPORA LEAF SPOT

- **CAUSAL AGENT**
 - Fungus (*Cercospora spp.*)
- **CONDITIONS FOR DISEASE DEVELOPMENT**
 - Infection requires free water and is favoured by temperatures between 26-32 °C
- **MANAGEMENT AND CONTROL**
 - Monitor the plants regularly
 - Prune and dispose infected leaves properly
 - Regulate leaf wetness



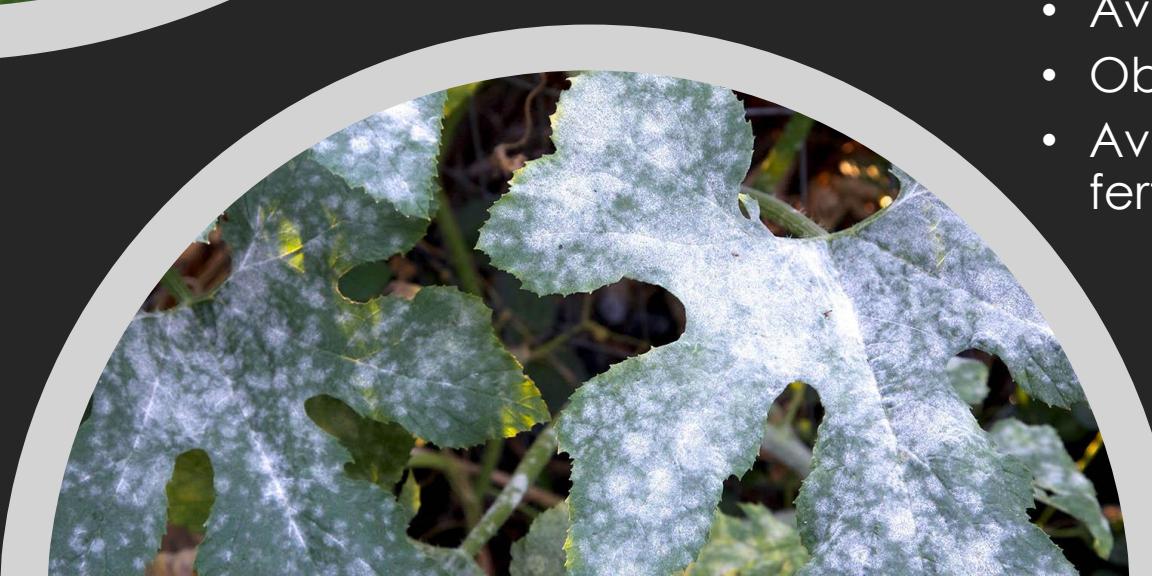
BACTERIAL SPOT

- **CAUSAL AGENT**
 - Bacteria (*Xanthomonas euvesicatoria*)
- **CONDITIONS FOR DISEASE DEVELOPMENT**
 - Infection is favored by 24-30°C temperature and prolonged periods of high humidity.
- **MANAGEMENT AND CONTROL**
 - Avoid over irrigation
 - prune infected leaves and dispose properly
 - Disinfect tools with 10% household bleach
 - Avoid working with the plants when leaves are wet.





POWDERY MILDEW

- **CAUSAL AGENT**
 - Fungus (*Leveillula taurica*)
 - **CONDITIONS FOR DISEASE DEVELOPMENT**
 - Infection requires dry and cool (15-25°C) temperature.
 - **MANAGEMENT AND CONTROL**
 - Avoid planting in low, shady areas
 - Observe proper planting distances
 - Avoid excessive use of nitrogen fertilizers
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BACTERIAL SOFT ROT

- **CAUSAL AGENT**
 - Bacteria (*Erwinia carotovora* var. *carotovora*, *Pseudomonas marginalis* pv. *marginalis*)
- **CONDITIONS FOR DISEASE DEVELOPMENT**
 - Infection is favored by warm and humid conditions.
- **MANAGEMENT AND CONTROL**
 - Monitor plant regularly
 - Remove infected plants and dispose properly, observe the adjacent plants.
 - Disinfect tools with 10% household bleach after use.
 - Regulate watering

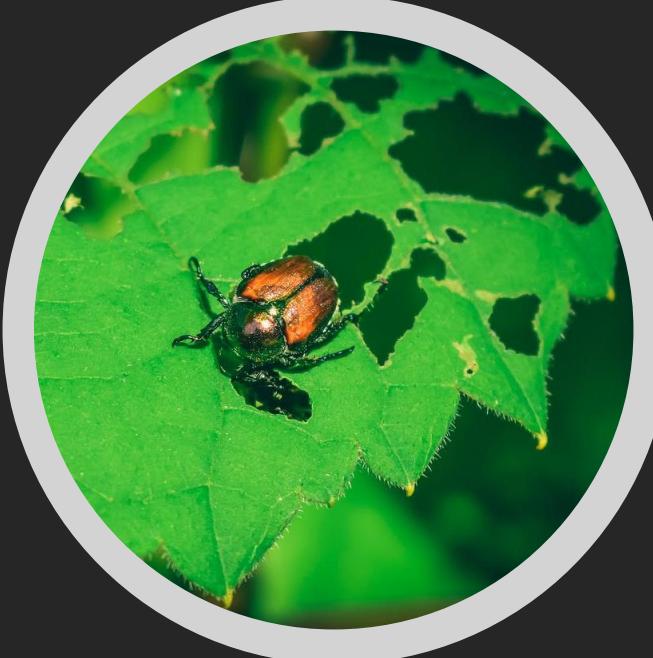




IPM
Integrated Pest Management

IPM (INTEGRATED PEST MANAGEMENT)

- IPM is a holistic approach to sustainable agriculture.
- It focuses on managing insects, weeds and diseases through a combination of cultural, biological and chemical measures that are cost effective, environmentally sound and socially acceptable. This includes responsible use of crop protection and plant biotech products.



THE NEED TO ADVOCATE IPM IS NOW!

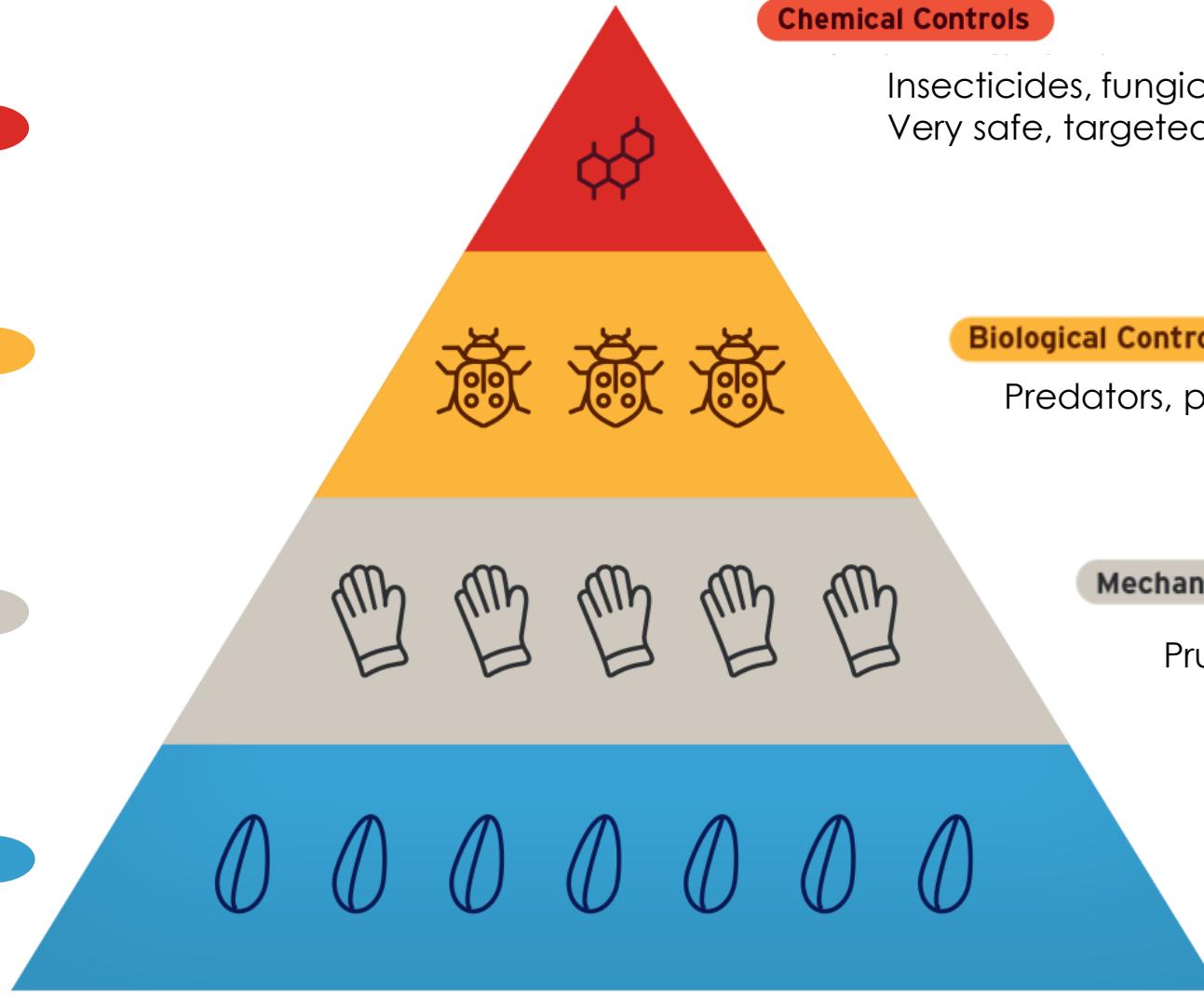
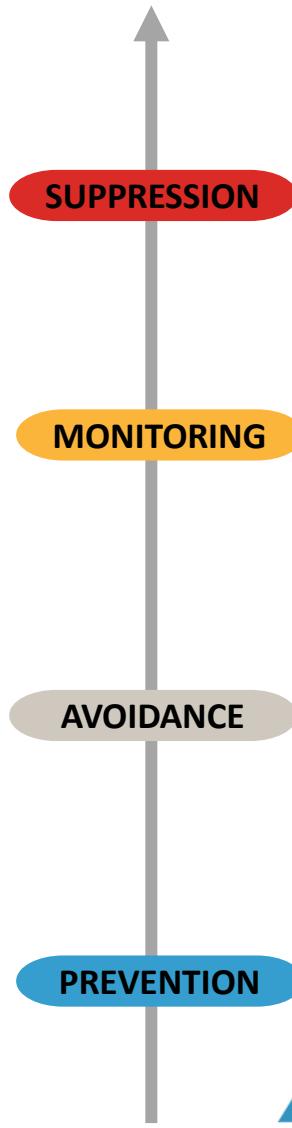
- Global population is on the rise and therefore so is food demand.
- This means farmers must increase land while protecting biodiversity and looking after the environment.
- IPM provides farmers with tools and strategies to:
 - Sustainable maximize production and,
 - Minimize losses due to insects, weeds and diseases.



THE NEED TO ADVOCATE IPM IS NOW!

- High pesticide residues in crops (Bajet, 2015 NCPC-UPLB); acute and chronic effects on human health.
- Prevent or delay insecticide resistance (immunity)
- More insecticide input = more costs to farmers





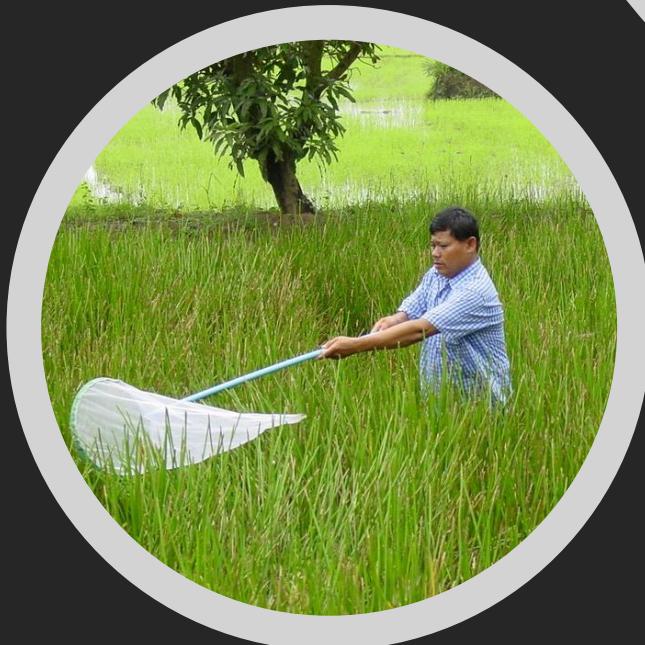
METHODS OF IPM



PHYSICAL AND MECHANICAL CONTROL



CULTURAL CONTROL



BIOLOGICAL CONTROL



CHEMICAL CONTROL



CULTURAL CONTROL

- Use of resistant varieties
- Crop rotation
- Intercropping
- Mulch
- Soil sterilization
- Planting of natural insect repellent

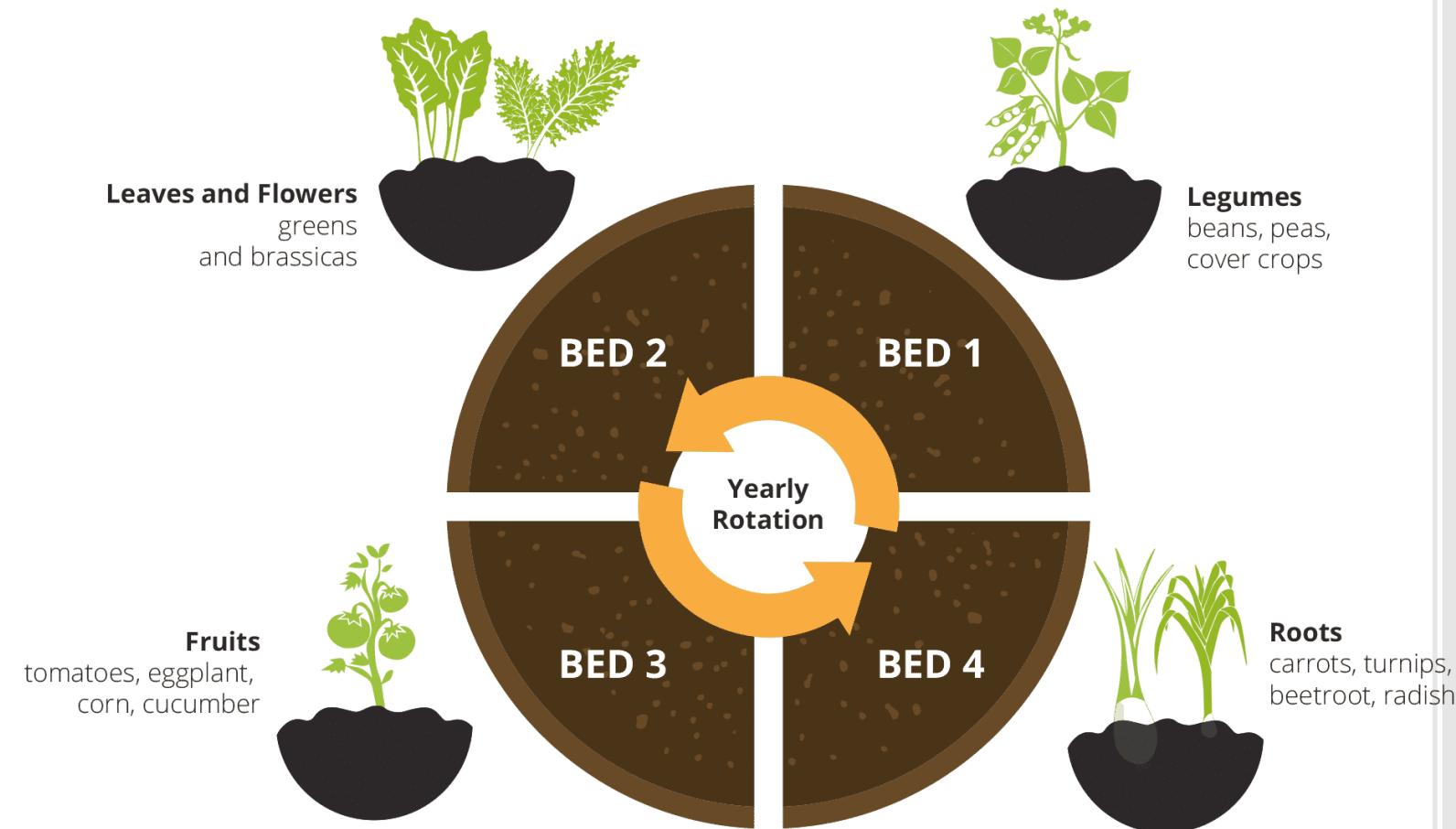




USE OF RESISTANT VARIETIES



CROP ROTATION

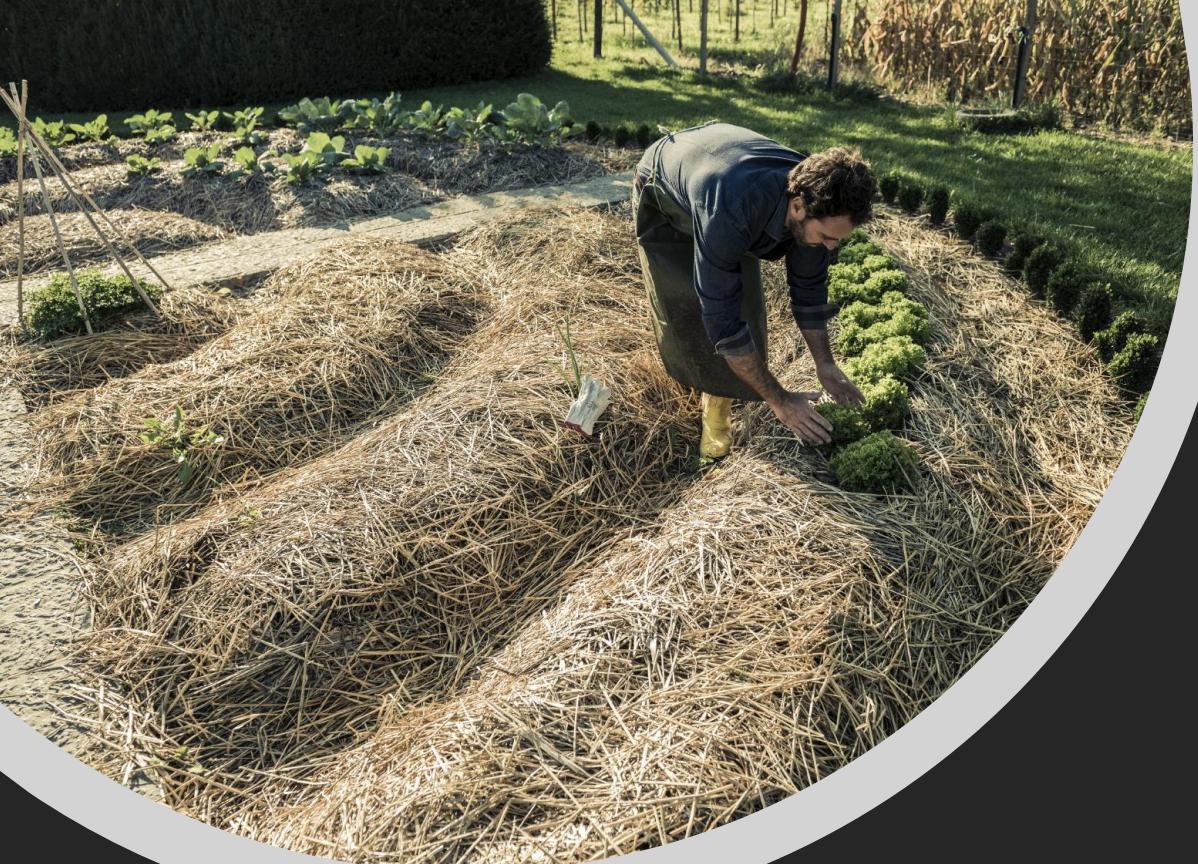


- Is the practice of growing different types of crops in the same area or container sequentially.
- Reduces reliance on one set nutrients, and the probability of developing resistant pests and weeds.

INTERCROPPING

- Is an all-encompassing term for the practice of growing two or more crops in proximity, in rows or strips that are close enough for biological interaction.





MULCHING

- Control weeds
- Helps retain moisture
- Keeps soil and plant roots cooler
- Protects from common pests and diseases
- Organic mulch adds nutrients to the soil



NATURAL INSECT REPELLENT

- Basil
- Lemon grass
- Marigold



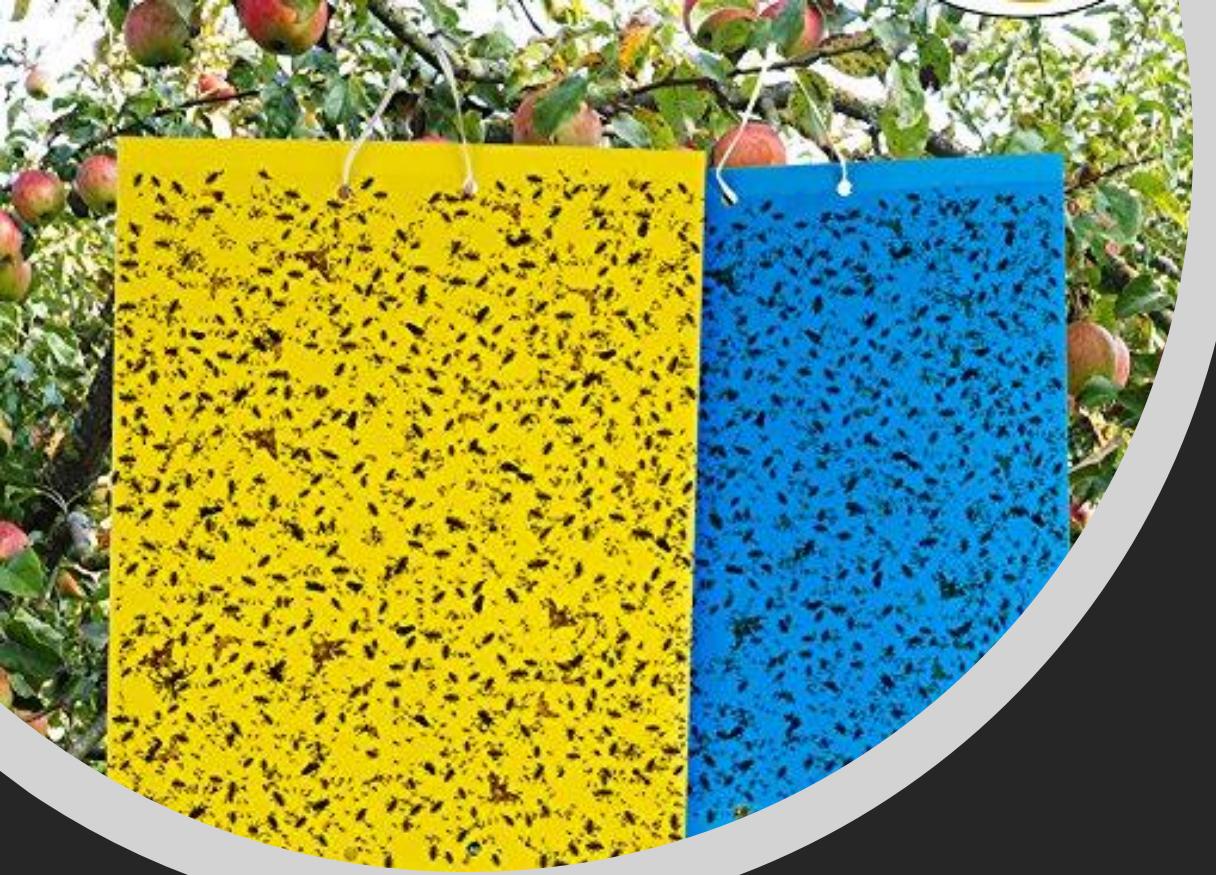
PHYSICAL AND MECHANICAL CONTROL

- Hand removal of insects/larvae/pupa.
- Pheromones traps
- Sticky trap
- Light trap
- Protective structure
- Fruit bagging



HAND REMOVAL OF INSECTS





STICKY TRAPS



INSECT LIGHT TRAPS





FRUIT BAGGING

SOIL SOLARIZATION



PROTECTIVE STRUCTURES





BIOLOGICAL CONTROL

- Beneficial insects
 - Biopesticides
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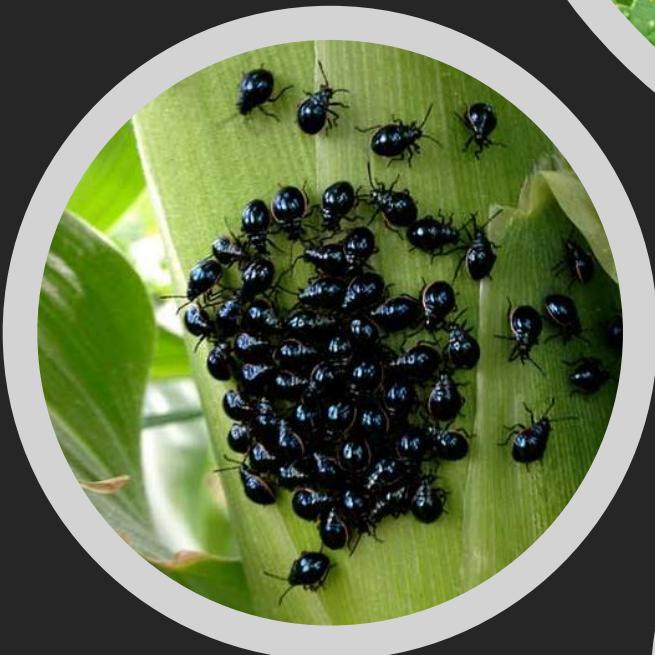


BIOPESTICIDES

Sprayed in the early morning or late afternoon.

FLEA BEETLE

- **VEGETABLES**
 - Pechay
 - Mustasa
 - Chinese cabbage
- **PARTS OF THE PLANT AFFECTED**
 - Leaves
- **SIGN(S) OF DAMAGE**
 - Shot hole damage on leaves
- **MANAGEMENT AND CONTROL METHOD**
 - Regular Monitoring
 - Remove infested plant
 - Remove larvae
 - Use microbial insecticides such as *Bacillus thuringiensis*
 - Spinosad



LEAF MINER

- **VEGETABLES**

- Cucurbits
- Solanaceous
- Legumes
- Allium
- Okra

- **PARTS OF THE PLANT AFFECTED**

- Leaves

- **SIGN(S) OF DAMAGE**

- Tunnel/mine of leaves

- **MANAGEMENT AND CONTROL METHOD**

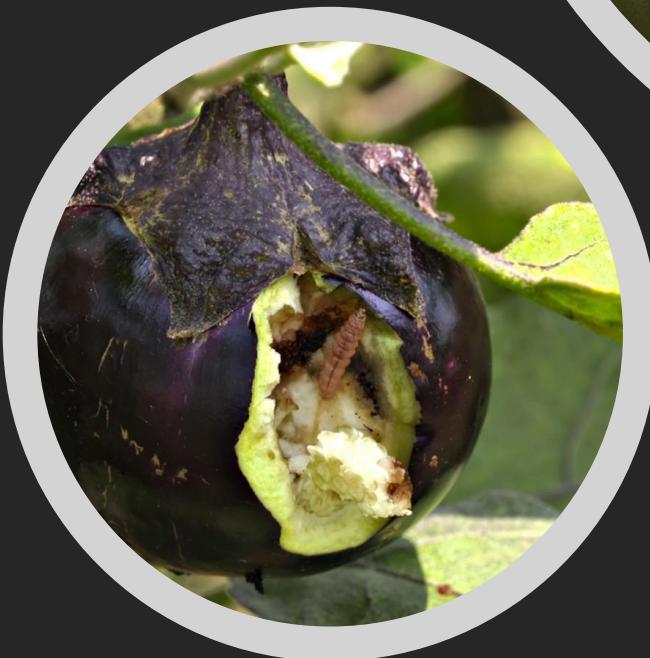
- Regular Monitoring
- Prune/remove affected parts of plant
- Use blue sticky trap



EGGPLANT FRUIT AND SHOOT BORER

Leucinodes orbonalis

- **VEGETABLES**
 - Eggplant
- **PARTS OF THE PLANT AFFECTED**
 - Shoots and fruits
- **SIGN(S) OF DAMAGE**
 - Wilting of shoots
 - Holes on fruits
- **MANAGEMENT AND CONTROL METHOD**
 - Regular Monitoring
 - Removing of affected fruits and shoots
 - Release of earwigs (beneficial insects)



THrips

Thrips palmi

- **VEGETABLES**

- Cucurbits
- Solanaceous
- Brassicas
- Allium

- **PARTS OF THE PLANT AFFECTED**

- Leaves and fruits

- **SIGN(S) OF DAMAGE**

- Upward curling of leaves
- Older leaves silvery
- Distorted leaves; stunted plants

- **MANAGEMENT AND CONTROL METHOD**

- Regular Monitoring
- Pruning of infested leaves
- Spray neem extracts early in the morning
- Use of blue sticky traps



APHIDS

Aphis gossypii

- **VEGETABLES**
 - Cucurbits
 - Solanaceous
 - Okra
 - Papaya
 - Legumes
- **PARTS OF THE PLANT AFFECTED**
 - Leaves and flowers
- **SIGN(S) OF DAMAGE**
 - Curling of leaves
 - Sooty molds
- **MANAGEMENT AND CONTROL METHOD**
 - Regular Monitoring
 - Remove infested leaves and bury
 - Use yellow sticky traps to prevent population growth
 - Spray botanical (neem oil), insecticide soaps, *Beauveria bassiana*



WHITEFLY

Bemisia tabaci

- **VEGETABLES**
 - Cucurbits
 - Solanaceous
 - Okra
 - Legumes
- **PARTS OF THE PLANT AFFECTED**
 - Leaves
- **SIGN(S) OF DAMAGE**
 - Silvery of leaves
- **MANAGEMENT AND CONTROL METHOD**
 - Regular Monitoring
 - Weeding to destroy host plants
 - Use of yellow sticky traps
 - *Beauveria bassiana*



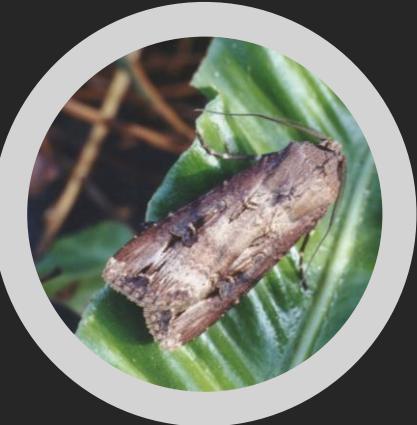
HARABAS

Spodoptera

ARMY WORM

S. exigua





CUTWORM

S. litura