Integrated Pest Management

- IPM requires knowledge of insects, plants and control strategies.
- IPM does not mean zero pests.
- IPM aims to prevent pest problems.
- IPM may take longer for control to be noticed
- IPM utilizes all available control tactics: cultural, mechanical or physical, biological , and chemical control-only after careful monitoring of insect populations

MONITORING

- Many insect pests are small and live in hidden locations.
- Monitoring needs to be thorough and happen on regular basis.
- When thinking about a pest, think about what type of insect it is, where it is located, and what is doing. The insect may not be causing a problem due to the type, location or activity.

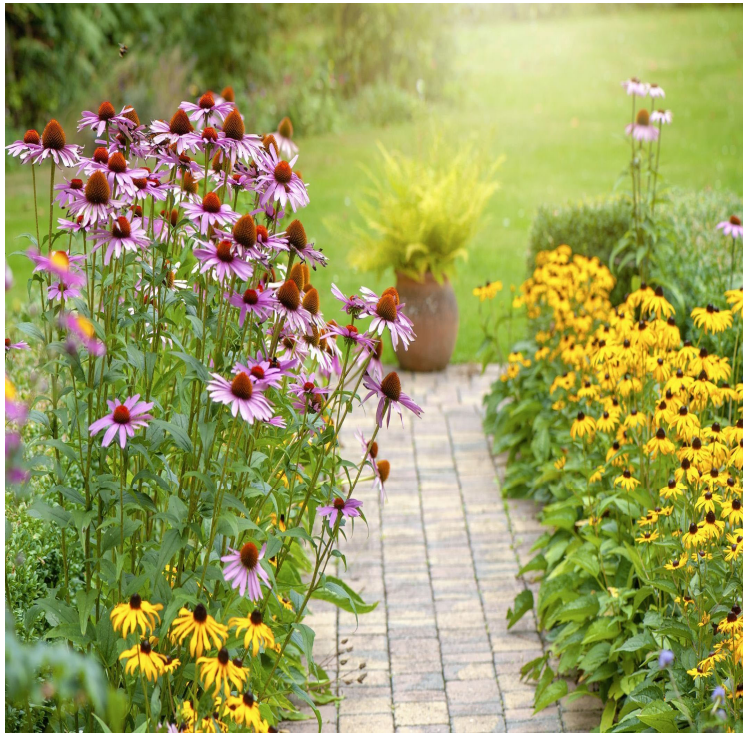
Once an insect is determent to be a pest, consider the location and size of the pest population.

- Recommended monitoring tools: hand lens or magnifier, knife, sticky traps, collection containers, and field guides for identification.

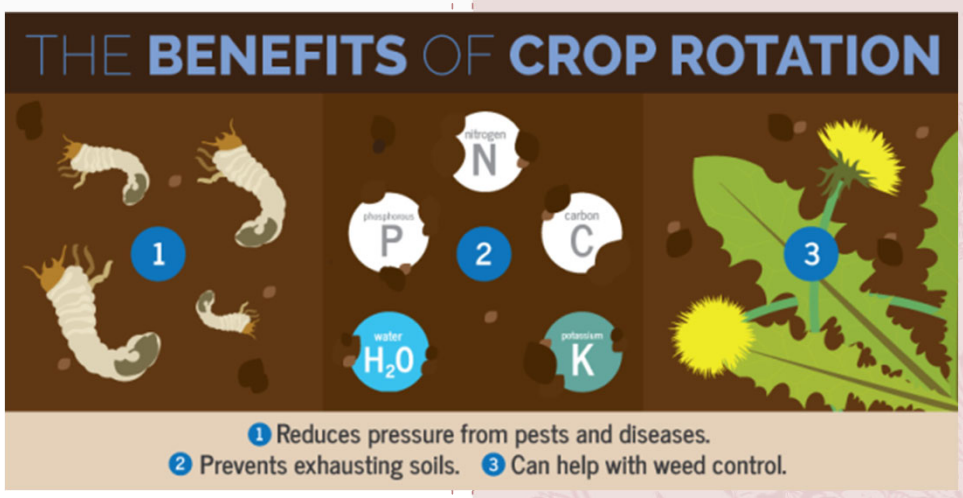
Cultural Controls

Modifications to normal plant care to reduce or avoid pest problem. All about prevention of pests!

Site Selection



- Right plant, right place
- Sunlight requirements
- Watering requirements
- Drainage requirements
- Group like plants together

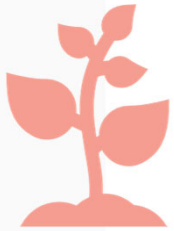


Crop Rotation

Avoid growing same plant in same location

Switch areas for different plant families

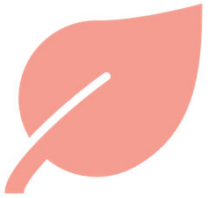
Soil Preparation



Doing the work to the soil prior to planting provides what plants need to grow

Improve drainage

Add nutrients



Tilling loosens soils

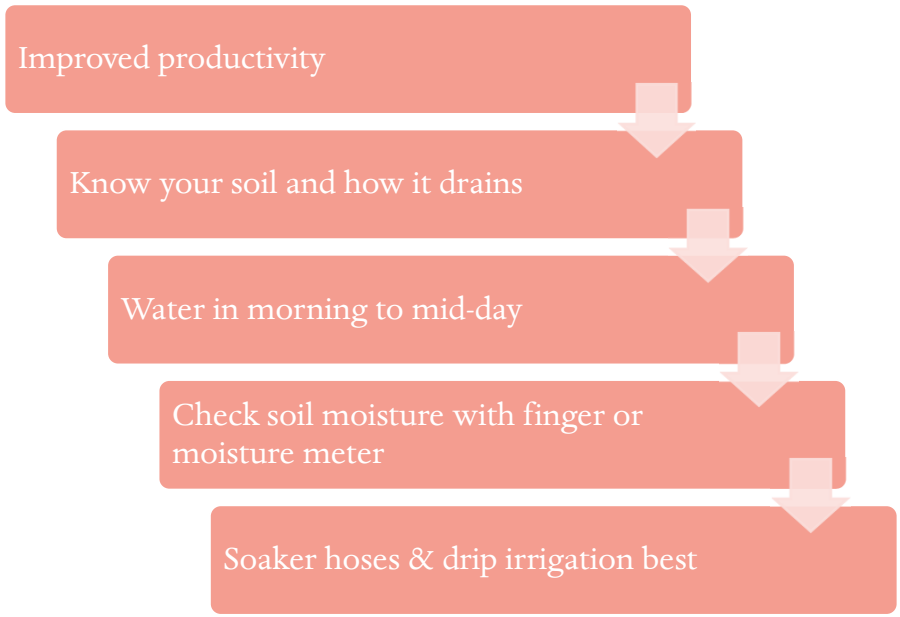
kills overwintering pests

Plant Selection

- Plants adapted to certain areas
- Can reduce chance of pests/diseases
- Determines planting time

Healthy Plants keep Pests Away

Watering



Fertilization

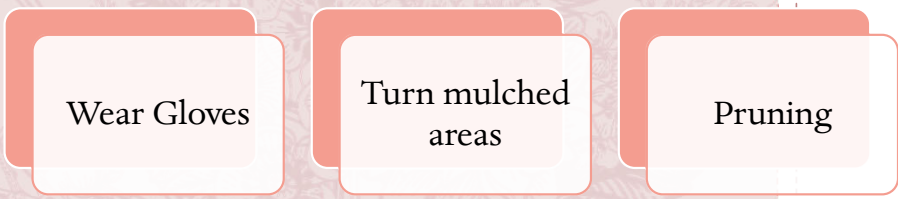
- Fertilizer, compost, manure
- Provides nutrients to plant
- Need to have good soil drainage for fertilizers to work properly

Sanitation

Removal of thick vegetation

Remove sources overwintering pests

Reduce wees/competing plants



Spacing

Allows air flow

Reduces diseases

Go Vertical!

Mechanical & Physical Control

Use of labor, materials (not pesticides) & Machinery to reduce pests

- Kill pests directly
- Keep from getting to plants
- Physical:
  - Alter light, humidity, temperature

USE MULCH

- Prevent water loss via evaporation
- Reduce growth of weeds
- Maintains soil temperature
- Prevents soil splashing
- Improve soil structure
- Improve movement of water into soil

Use of Row Covers

- Physically blocks pests from getting plants
- Must be put on BEFORE pests arrive

Plant Collars

VACUUMING/HAND PICKING

- No pesticides applied to plants
- Hand picking
  - Wear gloves
  - Dump wingless insects in tray bird feeder
  - Winged insects can be killed in bucket of hot soapy water
- Vacuuming

HIGH PRESSURE WATER SPRAYS

- No pesticide applied to plants

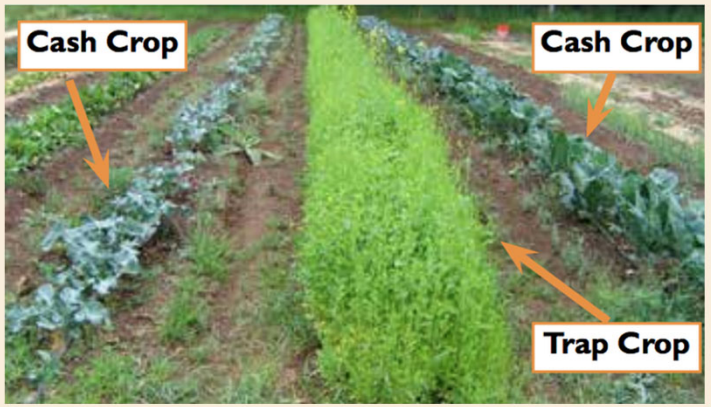
  No resistance
- Works best on small, soft-bodied insects
- Damage exoskeleton
- Knock off of host plant
- Won't work as well with flying insects

TRAP CROPPING

- Plant crop of lesser value to draw in pests to particular area

  Sacrifice crop

  Treat trap crop



BIOLOGICAL CONTROL

- Using other organisms to control a pest

  Augmentation-purchase/release

  Conservation

  Classical or Importation

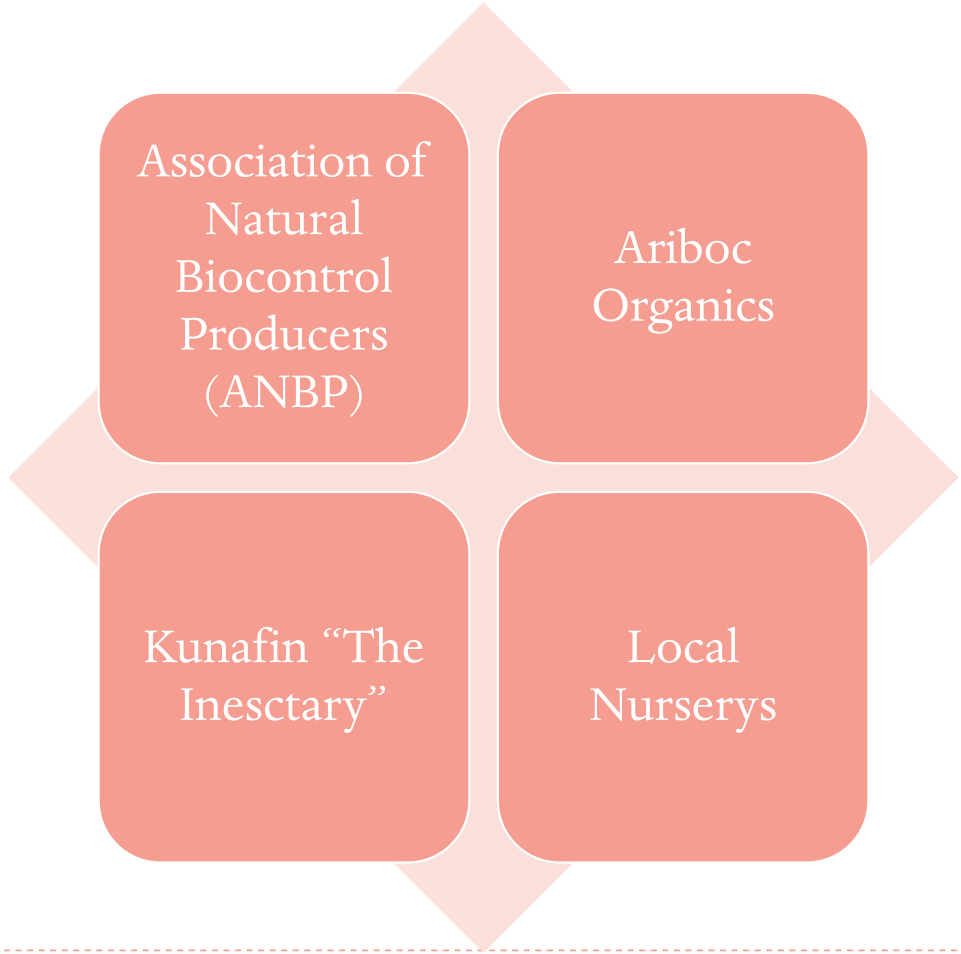
Augmentation Biological Control

Purchase and release of mass-produced natural enemies

More common in green houses

Research needed to use this approach

Where Can I Buy Good Bugs?



Chemical Control

Using pesticides, natural or synthetic, to control pest populations

Natural-naturally derived products used to manage pest populations

often have no residual & therefore may need several applications

Synthetic-man made products used to manage pest populations

typically a more stable molecule & therefore last longer in the environment

USE PESTICIDES WISELY

- Choose targeted pesticide if possible
- Read & follow label instructions
- Target treatment area
- Texas is a SITE state

INSECT GROWTH REGULATORS (IGRS)

Act on the hormones of insects

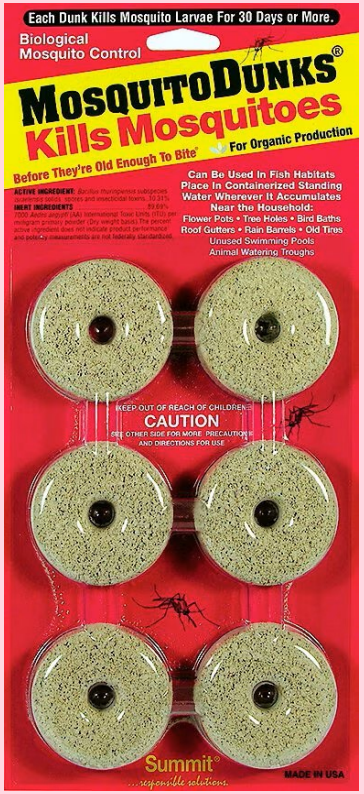
Specific for insects

Keep the insect in the immature state; unable to molt successfully into the next stage

Methoprene, pyriproxyfen, hydroprene, fenoxycarb

MIRCOBIALLY DERIVED-BACILLUS THURINGIENSIS (BT)

- Different varieties for specific groups of insects
- Must be ingested
- Damages gut lining, gut paralysis; stops feeding



MICROBIALLY DERIVED- SPINOSAD

- Must be ingested
- From soil-born organism
- Excites nervous system
- Selectively active on insects

  Foliage feeders

CONTACT HORTICULTURAL OIL

- Smothers insects
- Petroleum or veggie oil
- Soft bodied insect
- Good Coverage
- Phytotoxicity

CONTACT-INSECTICIDAL SOAP

- Penetrate insect's waxy covering (cuticle) & dissolve cell membranes
- Soft bodied insects

INORGANIC-DIATOMACEOUS EARTH

- Fossilized diatoms
  - Contains silicon
  - Abrades waxy coating
  - Dust mask/respirator

BOTANICALS-NEEM & LIMONENE

- Azadirachtin
- IGR & feeding deterrent
- Repellent properties
- Some systemic activity
- Oil formulation will smother
- Degraded by sunlight & rain
- Low mammalian toxicity
- Low residual

- From citrus
- Contact kill

BOTANICAL-PYRETHRIN/PYRETHRUM

- From daisy-like flower
- Continuous nerve stimulation
- Immediate knockdown
  - Insects often metabolize product & recover
- Short residual
- Low mammalian toxicity
- Irritating to respiratory system, skin, eyes

The Two-Step Method – Fire Ant Control

- Step 1. Broadcast a fire ant bait once or twice a year to reduce fire ant colonies by 80 to 90 percent.
- Step 2. Treat nuisance and mounds such as colonies that move in the bait-treated area. Step 2 may not be needed.