Integrated Pest Management

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- 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

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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.

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Cultural Controls

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

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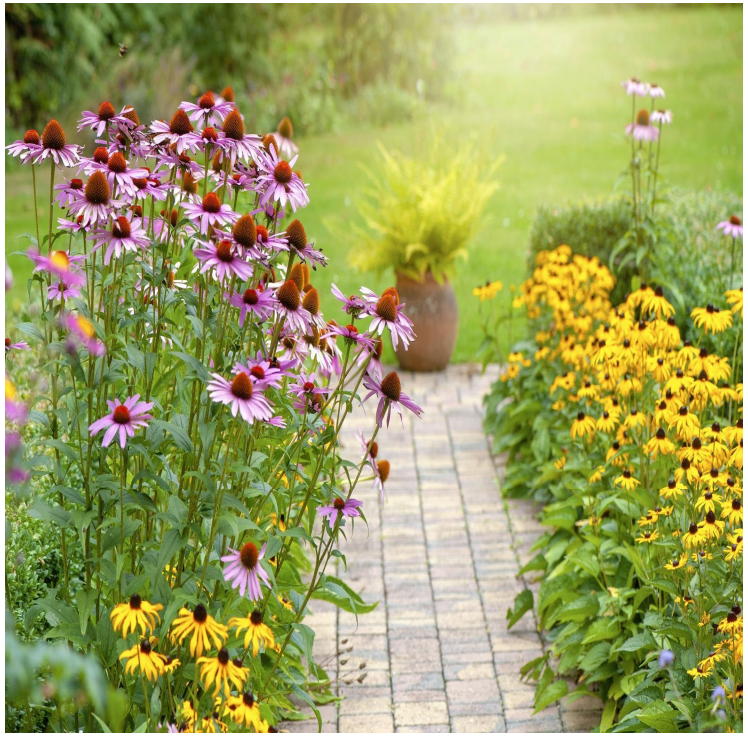
Site Selection



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

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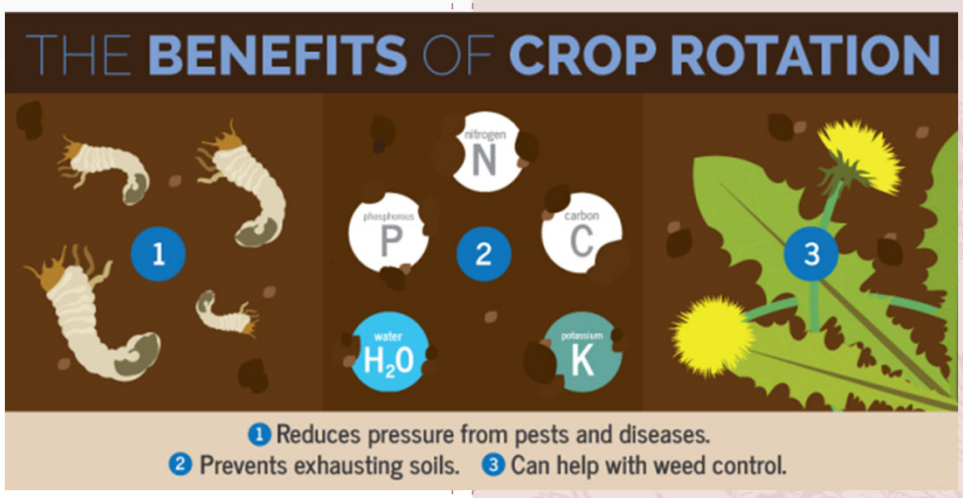

Crop Rotation

Avoid growing same plant in same location

Switch areas for different plant families

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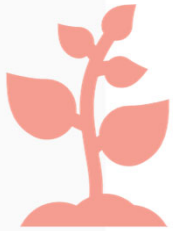
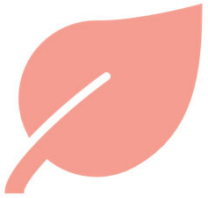
Soil Preparation



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

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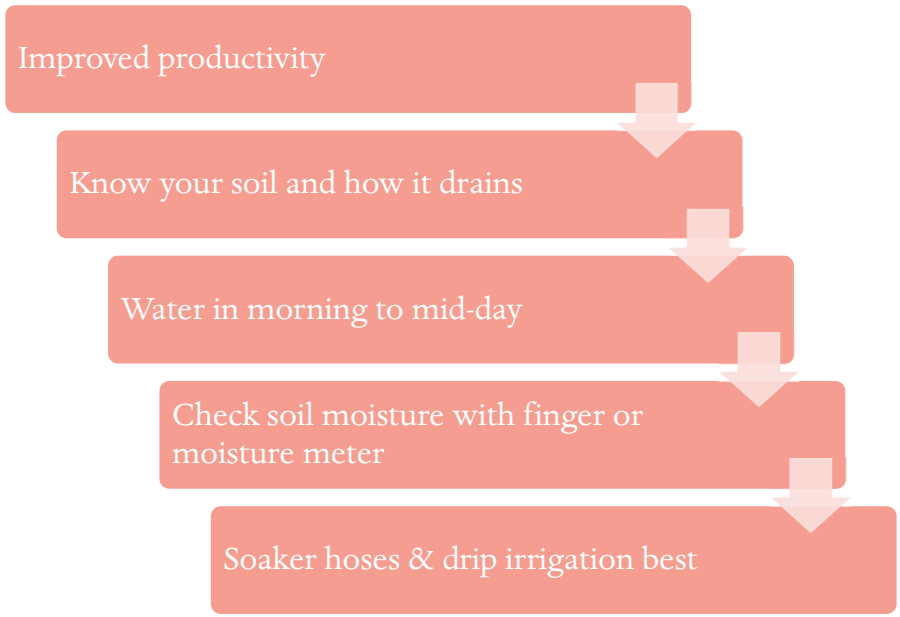
Plant Selection

- 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

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Sanitation

Removal of thick vegetation

Remove sources overwintering pests

Reduce wees/competing plants

Wear Gloves

Turn mulched areas

Pruning

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Spacing

Allows air flow

Reduces diseases

Go Vertical!

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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

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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

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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 s
- Vacuuming

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HIGH PRESSURE WATER SPRAYS

- No pesticide applied to plants

  No resistance

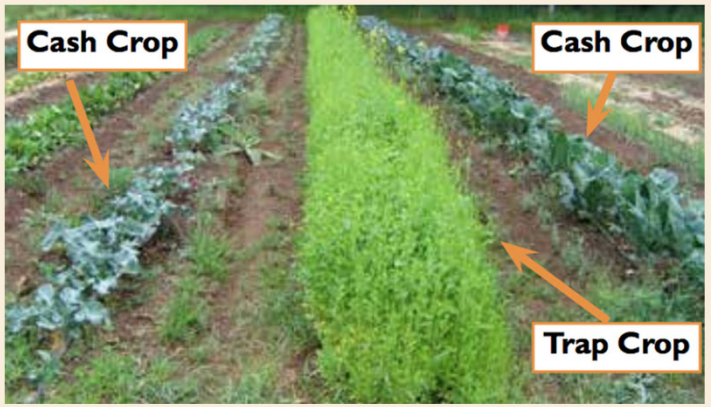
- Works best on small, soft-bodied insects
- Damage exoskeleton
- Knock off of host plant
- Won't work as well with flying insects

TRAP CROPPING

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

  Sacrifice crop

  Treat trap crop



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BIOLOGICAL CONTROL

- Using other organisms to control a pest

  Augmentation-purchase/release

  Conservation

  Classical or Importation

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Augmentation Biological Control

Purchase and release of mass-produced natural enemies

More common in green houses

Research needed to use this approach

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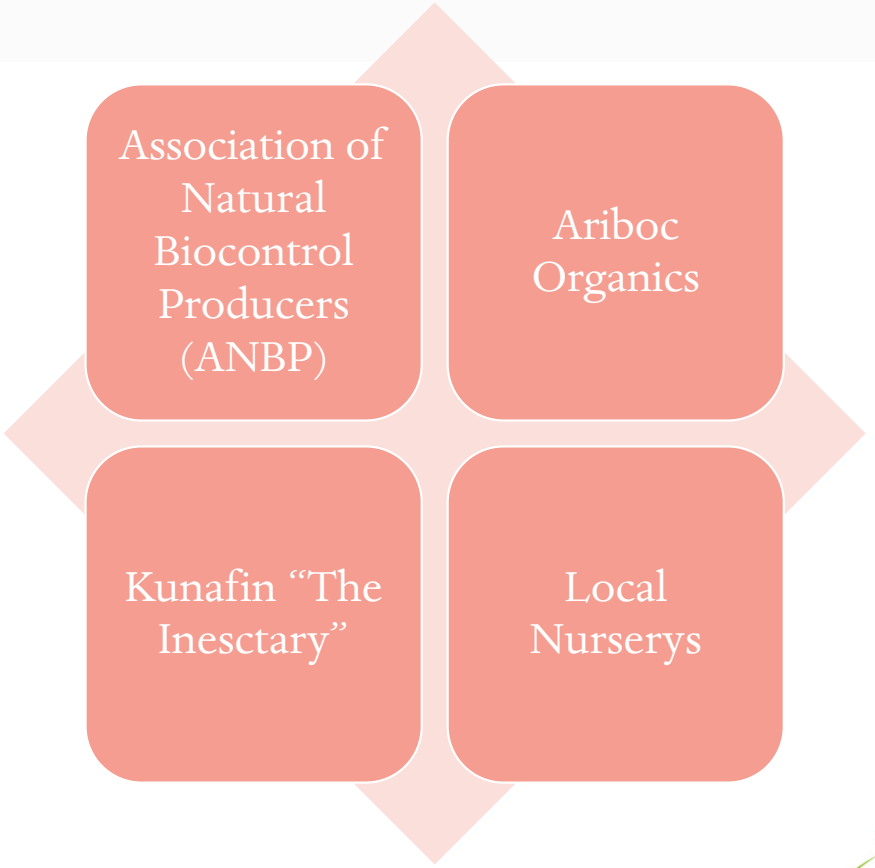
Where Can I Buy Good Bugs?



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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

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USE PESTICIDES WISELY

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

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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

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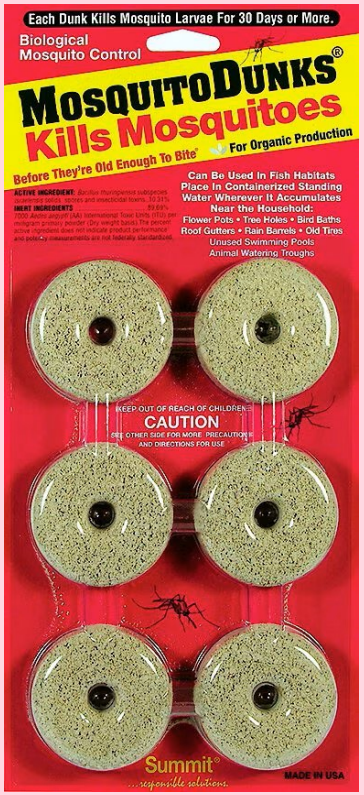
MIRCOBIALLY DERIVED-BACILLUS THURINGIENSIS (BT)

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



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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

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CONTACT-INSECTICIDAL SOAP

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

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INORGANIC-DIATOMACEOUS EARTH

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

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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

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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

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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.

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