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THE BASICS OF INTEGRATED PEST MANAGEMENT

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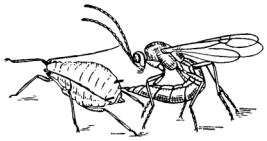
Integrated Pest Management (IPM)

- Is an ecosystem-based strategy.
- Focuses on long-term prevention of pests or their damage.
- Uses a combination of techniques: cultural, biological, physical, and chemical.

What Is a Pest?

- Any organism — plant, insect, disease pathogen, or vertebrate animal — that causes damage or loss of crop value.
- Many organisms occur on farms; only a small proportion are pests.
- Many organisms are beneficial: e.g., decomposing organic matter, pollinating crops, killing pests, etc.

Five Basic Principles of IPM:

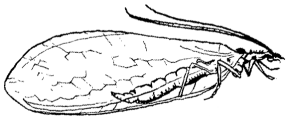


1. Prevent Pest Problems:

a. Appropriate site selection for crop
b. Resistant cultivars
c. Proper soil preparation before planting
d. Use weed- and disease-free amendments
e. Time cultural activities to discourage pest development
f. Keep plants healthy with best management practices
   i. Nitrogen use
   ii. Organic matter: cover crops, compost, or mulch
   iii. Irrigation management
   iv. Pruning, trellising

2. Pest identification: Know Who Your Enemies Are

a. Distinguish between pests, beneficial organisms, and incidental or innocuous organisms
b. Identify damage and possible culprits
c. Know when (season, plant life cycle) damage is likely to occur



3. Monitoring

a. Pest monitoring: e.g., sampling, trapping
b. Assess damage levels and potential for control by natural enemies
c. Natural enemy monitoring: signs of natural enemy presence, monitor parasitism
d. Weather monitoring: influence on pest population dynamics
e. Maturity of crop and vulnerable stages
f. Written records

4. Economic Threshold/Action Guidelines

a. Help you decide whether action is needed
b. For insects and mites, often a numerical threshold
c. Decide how much damage you can tolerate
d. A treatment threshold specifies pest density at which control measures need to be applied

to prevent loss of crop value — requires careful monitoring

5. Integrate Management Methods and Use All the Tools Available

a. Biological Controls

i. Encourage natural enemies by planting insectary plants
ii. Release natural enemies: wasps, predatory nematodes, etc.
iii. Use biological pesticides, diseases of pests: e.g., Bt

b. Cultural Controls: Modify normal practices to reduce pest establishment, reproduction, dispersal, and survival.

i. Remove cover or habitat: e.g., squash bugs
ii. Planting timing
iii. Trap crops
iv. Rotation
v. Sanitation
vi. Irrigation management
vii. Pruning to reduce hospitable environment
viii. Altering soil conditions: e.g., control potato scab by reducing Ca:P ratio, keep pH as close to 5.5 as possible, and maintain soil moisture

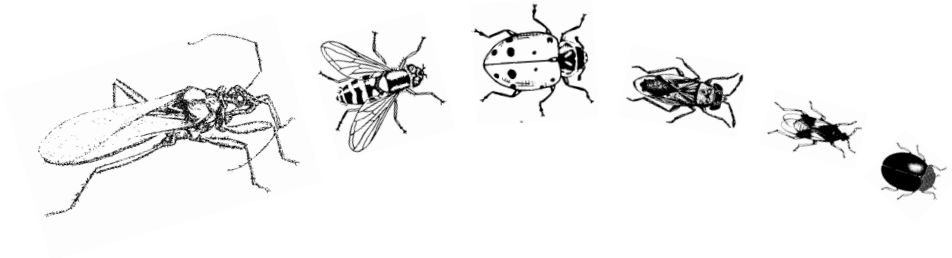
c. Mechanical/Physical Controls

i. Barriers such as Tanglefoot for ants; trunk banding for codling moth
ii. Soil solarization for diseases & weed seed
iii. Cultivation to bring weed seeds or beetle grubs to surface
iv. Traps: insects and rodents
v. Vacuums for true bugs

d. Chemical Controls: Pesticides

i. Base use on field monitoring and/or trapping
ii. Target sprays to specific pest, vulnerable crops, hot spots
iii. Time sprays and use effectively — use weather data (e.g., Degree Days)
iv. Choose Reduced Risk materials

More tools and information at http://www.ipm.ucdavis.edu/



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