

## **SIMPLE, HOLISTIC, COMMON SENSE METHOD OF MANGING GARDEN PESTS & DISEASES**

### **Integrated Pest Management IPM**

- In IPM, the use of all tactics - biological, cultural and mechanical - are utilized prior to using a pesticide. IPM is not an instant fix, but it is effective. Your results will improve over time as you learn to better identify and control the problems in your garden.

**Excellent source for IPM information based on plant, crop, or pest: WSU Hortsense** (E.g., search Google (e.g. for “WSU Hortsense apple”). That’s the easiest way. You can also go to the site: <http://hortsense.cahnr.wsu.edu/Home/HortsenseHome.aspx> Always search for the singular, not the plural. “Apple” will get results, “Apples” will not.

### **Five steps of IPM:**

1. Identify the pest (bring to Plant and Insect Clinic)
2. Understand its life cycle and behavior patterns
3. Monitor activity
4. Determine damage threshold
5. Implement control measures

### **Identify Pest/Understand Lifecycle & Behavior and Monitoring Activity**

- Once you’ve identified the pest, ask yourself questions to identify the best control:
  - Where do they hide?
  - What time of day will they appear?
  - When are they most active?
  - What are their favorite food sources?
- Be on the lookout for the adult insects.
- Knowing their behavior will be your best guide to prevent their damage.

### **Determine Damage Threshold**

- How much damage are you willing to accept?
- Remember that the garden doesn’t need to be perfect.
- Perfection is an unrealistic garden goal.
- When considering your damage threshold, ask questions like:
  - Is there enough foliage damaged to affect the plant’s energy production?
  - Would the flower or ornamental value be impacted?
  - Would you eat it with the damage on it?
  - Can the damage on the fruit be cut out?
  - Are you selling the crop?
  - What’s the cost benefit to the control measure?

## Pest Management Options

### Step 5. "Implement control measures" in IPM

#### 1. Prevent access

#### 2. Manual control

#### 3. Repellent

- **Kaolin**-Applied as a spray to leaves, stems, and fruit, it acts as a repellent to some insect pests. Some formulations are OMRI-listed for organic use (E.g., Surround)
  - **Note:** *kaolin application can disrupt bee foraging; apply at night to minimize exposure to foraging bees.*

#### 4. Organic treatment (In order of most benign to most severe)

- **Bt**
  - (E.g., DiPel, Bonide Thuricide BT Conc)
  - **Note:** *Little or no toxicity to bees, but will kill all butterfly/moth larvae, even desirable ones.*
- **Diatomaceous earth** - *If bees or beneficial insects are seen crawling on leaf or stem surfaces with recently applied DE, spray clean water to wash away the DE. Take care to avoid creating clouds of DE dust during application.*
- **Neem oil** ]
  - azadirachtin
  - E.g., Safer Brand BioNEEM Multi-Purpose Insecticide & Repellent Conc [Organic
  - Note: Only toxic to bees on direct contact—if applying during bloom, apply at night to minimize risk to bees
- **Insecticidal Soap**
  - Potassium salts of fatty acids
  - E.g., M-Pede, Safer's Soap
  - Note: Do not apply directly to bees or beneficials, apply at night
- **Spinosad** Some formulations are \*OMRI-listed for organic use.
  - E.g., Entrust, Success, Regard, Bonide Captain Jack's Deadbug Brew R-T-U
    - Note: Apply at night during dry weather to minimize risk to bees. Granular products are less risky to bees
- **Boric Acid**
  - E.g., Revenge Liquid Ant Bait, Terro Ant Killer II Liquid Ant Baits
  - Note: Low toxicity to adult bees. Uses for indoor pest control are unlikely to affect bees- use caution if applying foliar fertilizers that contain boric acid.
- **Pyrethrin** Some formulations are \*OMRI-listed for organic use.
  - E.g., PyGanic, Azera
  - Note: highly toxic to bees, Applying at night can reduce risk to bees)

## 5. Synthetic treatment

- **Acetamiprid**- neonicotinoid -Highly toxic to bees (E.g. Acetamiprid RTU Insecticide, Ortho Flower, Fruit & Vegetable Insect Killer R-T-U)
- **Acephate**—(E.g., Bonide Systemic Insect Control) Highly toxic to bees. Residual toxicity lasts > 3 days.
- **Bifenthrin**-(E.g., Brigade, Capture, Discipline, Sniper, Talstar) Highly toxic to bees.
- **Carbaryl (E.g., Sevin)**-Highly toxic to bees.
- **Cyfluthrin** – (E.g., Bayer Advanced Power Force Multi-Insect Killer R-T-S) Highly toxic to bees. Residual toxicity longer than 8 hours
- **Esfenvalerate**-. (Monterey Bug Buster II, Asana) Highly toxic to bees
- **Gamma-cyhalothrin**-( E.g., Bolton, Cobalt, Declare, Proaxis )Highly toxic to bees, Highly toxic to bees- residual toxicity longer than 8 hours
- **Lambda-cyhalothrin** (Warrior, Cyzmic, Demand, Voliam) Highly toxic to bees. residual toxicity longer than 8 hours
- **Malathion (E.g., Fyanon) Residual toxicity > 3 days**
- **Permethrin**-E.g., Ambush, Bee Gone, Pounce, Permastar) Highly toxic to bees.
- **Zeta-cypermethrin**-Highly toxic to bees- residual toxicity longer than 8 hours