



# Preventing Pest Problems at Seeding

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**UNIVERSITY OF CALIFORNIA**  
Agriculture and Natural Resources

Statewide Integrated  
Pest Management Program

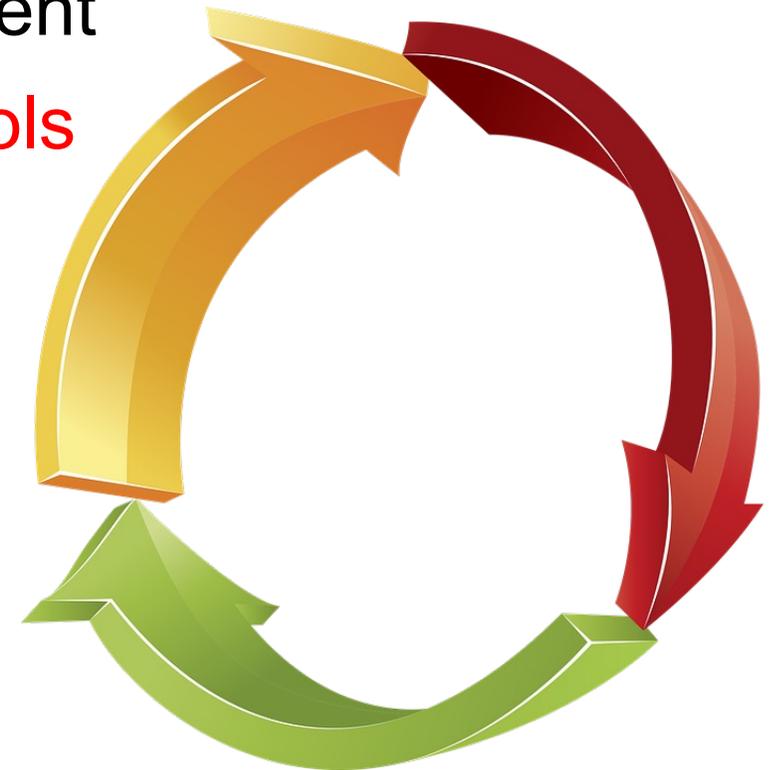
# Overview

- What is IPM and why should you use it?
- What are seedling pests?
- How can you prevent and control seedling pests?



# Use an Integrated Pest Management approach (IPM)

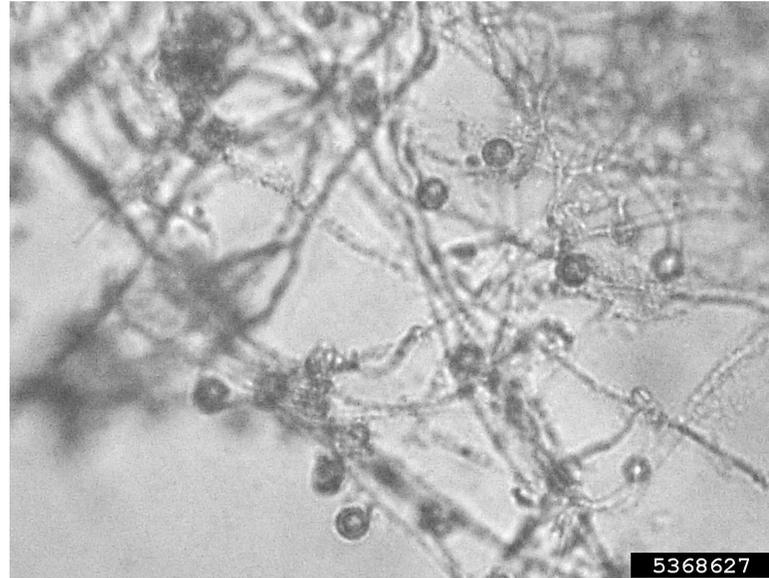
- A way to effectively manage pests while using methods that minimize risks to humans and the environment
- **Relies on biological, cultural, physical controls**
  - Biological – natural enemies
  - Cultural – altering the environment
  - Physical – directly killing or blocking pests
- **Focuses on pest prevention**
- Pesticides used when necessary



# What are seedling pests?



Invertebrates?



Pathogens?



Vertebrates?

None of these?

# Fungus Gnats

- Resemble fruit flies or very small mosquitos
- Eggs laid in moist soil
  - Larva feed on plant roots
- Stunted plant growth and wilting
- Overwatering – wet soil
- Watering from the top



# Fungus Gnats

- Reduce watering, especially from the top
- Water from bottom using saucers
- Use sticky traps
- Bt. israelensis products



# Wireworms

- Brown-yellow larvae of click beetles
- Thrive in damp soils with high organic matter
- Feed on roots and shoots
- Can burrow into stems



# Wireworms

- Rotate aboveground and belowground crops
- Till the soil



# Aphids

- Many colors
- Suck on plant sap and excrete honeydew
- Leaf curl or distortion
- Check underside of leaves
- Some adults may have wings



# Aphids

- Natural enemies
- Hose off plants
- Handpick



# Armyworms & Cutworms

- Large caterpillars (1-1.5 inches)
- Armyworms feed on the crown of seedlings
- Cutworms "cut down" young plants by feeding on their stems and roots
- Immature larvae may be hard to see



# Armyworms & Cutworms

- Remove weeds or debris
- Handpick
- Use protective cloth
- Place cardboard collars around seedling stems



# White grubs

- The larvae of several species of scarab beetles
- Feed on plant roots
- May attract small mammals and birds
- Primarily an issue in gardens near grassy areas, or that were previously grassy areas



# White grubs

- Handpick from soil
- Make a meal out of them
- Till the soil



# Flea Beetles

- Jump when disturbed
- Feed on leaves creating shot-hole damage
- Overwinter in vegetation debris



# Flea Beetles

- Remove weeds
- Use protective cloth
- White sticky traps



# Garden symphylans

- 1/3 inch long
- Feed on seedling roots
- Thrive in soils with high organic matter
- Very difficult to control



# Earwigs

- Feed on dead and living things, mostly at night
- Hide in dark, cool, moist places during the day
- Can cause significant damage to seedling leaves



# Earwigs

- Reduce shady, cool hiding spots
- Trap using shallow containers with  $\frac{1}{2}$  inch of oil in the bottom
- Trap inside of rolled up newspaper or cardboard



# Snails & Slugs

- Chew holes in seedling leaves
- Favor tender, new growth
- Thrive in moist, cool environments



# Snails & Slugs

- Reduce moisture and hiding places
- Wood board traps
- Beer traps



# Damping off

- Caused by the plant pathogens *Pythium*, *Rhizoctonia*, *Fusarium*, and *Phytophthora*
- Occurs in newly emerged seedlings
- Thrives in cool, wet, compact soils



# Damping off

- Reduce soil moisture
- Ensure soil is warm enough
- Clean and sterilize pots and soil



# Rodents

- Rats, mice, voles, chipmunks, squirrels, gophers
- Chew on seedlings and young plants
- Dig out and feed on germinating seeds
- Can also feed on plastic pots



# Rodents

- Seal openings larger than  $\frac{1}{4}$  inch
- Snap traps
- Fencing or screens



# Weeds

- Compete with seedlings
- Can spread pests to seedlings
- May be hard to distinguish between desired seedlings
- Wait for “true” leaves to appear before weeding



# Prevent pest problems

Ensure proper growing environment

Sunlight, temperature, moisture

Use clean potting soil and containers

Free of pathogens, weed seeds, or insects

Buy resistant varieties or treated seeds

Properly *harden off* or acclimate indoor seedlings to the outdoors

# IPM Tools

- Sticky traps
- Row covers
- Fences
- Your hands!
- Natural enemies
- Cultural practices
- Pesticides



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# Seed Starting Basics

Tracy Celio, *UC Master Gardener Program Coordinator in  
El Dorado and Amador county*



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# Seed Starting Basics

- Supplies
  - Appropriate Containers
  - Potting soil
  - Water
- Sow Seeds
- Germination
- Transplanting
- Direct Seed



Photo credit Sandy Hendricks, UC Master Gardener of Amador County



# Seed Starting Basics

- Read Your Seed pack
  - Hybrid, Heirloom, Open Pollinated
  - Disease Resistance
  - Plant Spacing
  - Days to Germination
  - Days to Harvest
  - Heat or Cold Tolerance
- Ask UC Master Gardeners



# Contact Your UC Master Gardener Office

- Classes
- Planting Guides
- Help Desk
- Resources
- Speakers
- Demonstration Gardens
- School Gardens
- Articles
- Research Partnerships
- Volunteer Training



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# Questions?



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