Be A Pest Detective

Diagnosing and Addressing Garden Problems

This educational program is brought to you by an Extension Master Gardener Volunteer.

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MASTER GARDENER VOLUNTEER PROGRAM

1

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4

Being a Pest Detective

- Use knowledge and clues to solve a mystery
- Clues
  - Motive
  - Opportunity
  - Crime Scene
  - Timeline of Events
  - Suspects
  - Evidence

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5

Motive & Opportunity

- Live & Procreate
  - Food
  - Water
  - Places to hide & rest
  - Few predators
  - Ideal conditions for young

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Scene of the Crime

- Where is the damage?
  - Top-down or bottom-up
  - Inside-out or outside-in
  - One side or all around
- Which parts of the plant?
  - Leaves, stems, branches, bark, flowers, fruit, or roots
- Are other plants affected?
  - Same type of plant
  - Multiple species

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Create a Timeline

- Is the plant healthy?
  - Was it planted properly?
  - Is it getting enough sun or water?
  - Was it recently moved or pruned?
- Did something happen nearby?
  - Was there construction recently?
  - Have neighbors treated their lawn?
- How has the weather been lately?

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Common Suspects

- Abiotic
  - Weather, water issues, pesticide drift, nutrition depletion, soil compaction
- Animal
  - Voles, mice, birds, rabbits, woodchucks, deer, pets, people
- Insect
  - Caterpillars, beetles, mites, borers, aphids
- Microbial
  - Fungi, (Rust, mildews, mold), bacteria (Wilt, rots) & viruses

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Speed of Change

- Sudden – Most likely abiotic
  - Weather event
  - Pesticide drift
  - *Or* grazing animals
- Gradual – Most likely biotic
  - Insects
  - Microbial (fungi, bacterial, viral)
  - *Or* past weather events

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Look for Evidence

- Signs
  - Physical evidence of the pest
  - Examples: Pest's body, scat or frass, or spores
- Symptoms
  - Results of the pest
  - Examples: Wilting, holes, galls, leaf color-change or spots

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Identify the Culprit

- Use clues to identify the pest **before** seeking treatment
- Very important to being successful
- Right tools for the wrong suspect won't help

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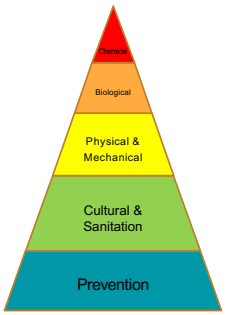
Integrated Pest Management (IPM)

- Common-sense steps to manage pests & optimize plant health
- Steps
  - Keep plants healthy
  - Use good gardening practices
  - Identify potential pests
  - Physically change the garden
  - Use control agents as needed



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14

Accept Imperfection

- Disclaimer: Gardens are never perfect
  - Plants will wilt
  - Leaves will have holes
  - Flowers will die
  - Vegetables will have weird shapes
- Decide if what you see is actually a problem

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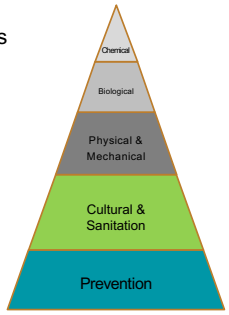
Prevention, Cultural & Sanitation

- Improve the health of at-risk plants to reduce the risk of pests
- Actions
  - Choose the right plants
  - Know your plants' pests
  - Use good gardening practices
  - Keep garden clean



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Choose Plants Wisely

- Benefits
  - Raises the healthiest plant possible
- Recommendation
  - Know preferred sun & water needs
  - Identify common problems & pests
  - Check plants regularly to catch problems early

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Keep Plants Healthy

- Benefits
  - Improves the immune system of at-risk plants
- Recommendations
  - Plant in the right place
  - Water regularly
  - Remove plant debris & weeds

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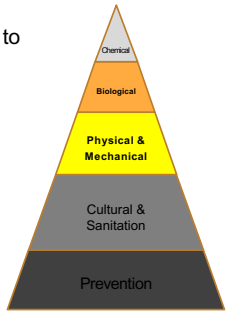
Physical, Mechanical & Biological Controls

- Change the physical environment to reduce the risk of pests
- Actions
  - Use physical barriers & fences
  - Remove water, safety & shelter
  - Invite predators



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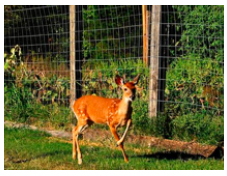
Physical Barriers

- Benefits
  - Blocks pests from accessing the at-risk plants
- Recommendations
  - Use **fences** for animal pests
  - Use **row covers** for insect pests
  - Use **mulch** for weeds & microbial pests (fungus, bacteria)



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20

Remove safe habitat

- Benefits
  - Discourages pest from staying nearby

- Recommendations
  - Mow nearby overgrown areas
  - Keep soil covered
  - Remove water elements

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Invite Predators

- Benefits
  - Helps control pests
- Recommendations
  - Incorporate flowers
  - Provide safe habitat
  - Add water elements (e.g. bird bath)

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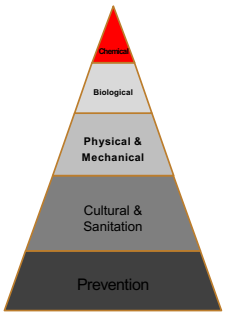
Chemical Options

- Use chemical compounds to reduce the risk of pests
- Actions
  - Select certified pesticides
  - Use the right pesticide



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Use Pesticides (if necessary)

- Benefits
  - Tested for effectiveness & safety against specific pests
- Recommendations
  - Identify the exact pest
  - Use the right pesticide
  - Apply pesticide **exactly** according to the label

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Types of Pesticides

Herbicides	Insecticides	Fungicides
• For plants • Preventative or curative • May kill desirable plants	• For insects • Preventative or curative • Ingested or contact-based	• For fungus, mold, mildew, & rust • **Preventative only**

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Homemade Pesticides

- Suggested Benefits
  - Lower cost
  - More “natural”
- **Not** Recommended
  - Not scientifically proven or tested
  - May not be effective & prolong damage/exposure
  - Can cause unexpected damage to plants or soil

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Treat Troubles

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Provide Additional Care

- Use for: Abiotic problems
- Benefits
  - Improves nutrient access
  - Protects roots
  - Encourages healthy growth
- Recommendations
  - Apply water & fertilizer as needed
  - Mulch around base
  - Check for plant damage

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Relocate Plants

- Use for: Abiotic problems
- Benefits
  - Corrects the amount of sunlight
  - Provides better growing conditions
  - Reduces exposure to pests
- Recommendations
  - Know the preferred conditions
  - Prepare the soil at the new location
  - Follow recommended replanting times and steps

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Removal

- Use for: Insect & microbial pests
- Benefits
  - Reduces the number of pests
  - Limits spread of problem
  - Helps protect nearby plants
- Recommendations
  - Remove as many insects & as much infected plant material as possible
  - Squish or drop insects into soapy water
  - Clean garden tools to prevent spreading disease

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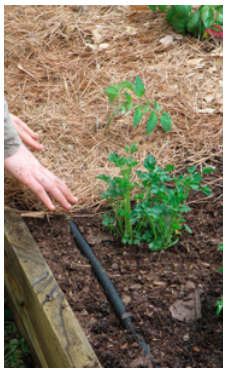
Protect Nearby Plants

- Use for: Animal, insect & microbial pests
- Benefits
  - Limits spread of problem
  - Improves survival of remaining plants
- Recommendations
  - Use mulch or other barriers
  - Relocate plants if needed



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Disposal

- Abiotic Problems & Insect Pests
  - Compost at home or in local yard waste program (Note: Some insects require special disposal steps)
- Microbial Pests (fungi, bacteria, viral)
  - Bury plant material 6-10 inches deep
  - Burn plant material
  - Compost in local yard waste program
  - Disinfect garden tools & pots
  - Use plant rotation in following years

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Garden Resources

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Master Gardeners

www.ramseymastergardeners.org

- Community members & volunteers with Extension-educated on horticultural topics
- Where to find Master Gardeners
  - Diagnostic clinics
  - Educational programs
  - Farmers Markets
  - Yard Waste Collection Sites
  - Fairs and other community events

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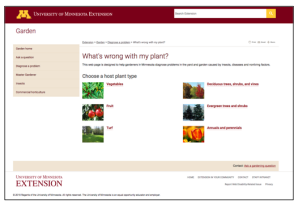
39

U of MN Extension Website

https://extension.umn.edu/yard-and-garden

- Lots of information
  - Common pests
  - Diagnosing problems
  - Details for growing
  - Tips & best practices
  - More resources



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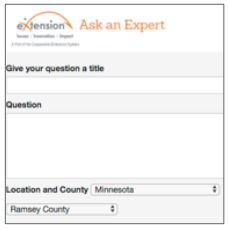
40

"Ask An Expert"

http://www.extension.umn.edu/garden/ask

- Master Gardeners respond within 48 hours
  - Provide as much detail as possible
  - Type of plant, plant history, symptoms & signs, and concerns
- Contact by Phone & leave a message
  - Response Caller ID will come up as "Unknown Caller"
- Contact by Email
  - Include photos (ensure the subject – plant, insect, etc.– is clearly visible)



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Pest Detective Recap

- Look for Evidence
  - Identify Potential Suspects
  - Check the Crime Scene
  - Learn the Timeline of Events
- Don't act until you know source of the problem
  - Follow Integrated Pest Management practices

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33

Learn More

- Websites
  - U of MN Extension: https://extension.umn.edu/yard-and-garden
  - Ramsey County Master Gardeners: http://www.ramseymastergardeners.org/
  - Ramsey County Diagnostic Clinic: http://www.ramseymastergardeners.org/index.php/events/diagnostic-clinic
- Books
  - The Organic Gardener's Handbook of Natural Insect and Disease Control, Barbara W. Ellis
  - Insects of the North Woods, Jeffrey Hahn
  - The Truth About Garden Remedies, Jeff Gillman

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34