

# INTEGRATED PEST MANAGEMENT

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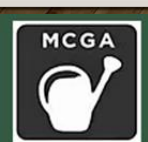


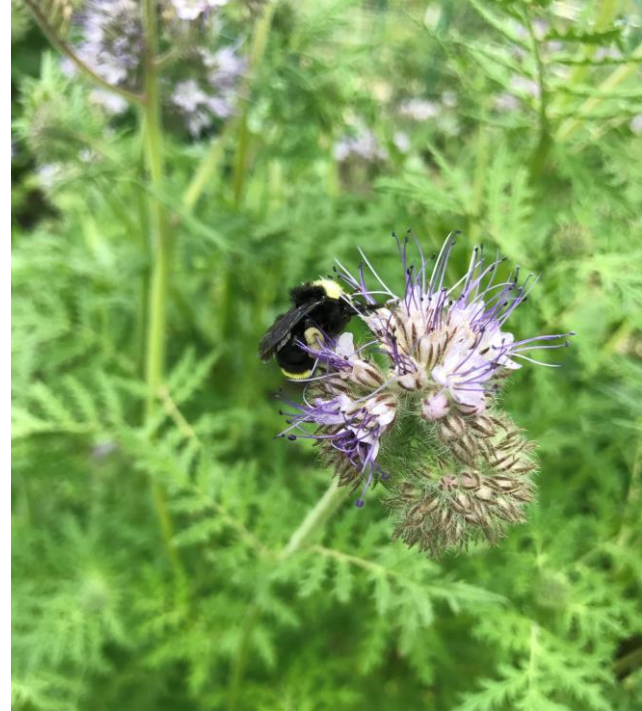
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# INTEGRATED PEST MANAGEMENT — IPM

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- Keep your plants healthy and protect the environment at the same time.
- Select plants and grow them with correct timing/temperature for the plant/variety in mind.
- Reduce plant stress with proper watering, maintaining healthy soil, appropriate fertilization, and pruning.
- Frequently, monitor plants or structures.
- Accurate diagnosis of the pests (Hortsense)
- A variety of control methods—cultural, mechanical, biological, and chemical—may be employed.







# ENTOMOLOGY-THE STUDY OF INSECTS

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- This is NOT an entomology class.
- This is a basic class that covers common garden pests and beneficial arthropods.
- For further information, see resources at the end of the lecture.



# GENERAL PRINCIPALS REGARDING PEST MANAGEMENT

- Inspect plant damage
- Identify your pest
- Know its lifecycle, habits, and habitat
- Decide on how to proceed
- Survey results and plan next steps



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A SHORT LIST  
OF COMMON  
GARDEN  
INSECT PESTS  
IN THE PNW

Aphids

Flea Beetles

Cucumber Beetles

Cabbage Family Pests

Leaf miners



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# APHIDS

- Suck the sap from plants
- Are vectors for disease
- Look for honeydew / sooty mold



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# APHID – CONTROLS

- Jet stream of water
- Horticultural oils
- Chemical controls
- Insect predators
- Monitor plants
- Provide proper nutrition to plants





# APHID – CONTROLS

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# FLEA BEETLES

- Several types attack many crops
- Above ground damage looks like small holes in leaves
- Below ground damage causes brown tunnels in tubers such as potatoes



# CRUCIFER FLEA BEETLES – LEAF DAMAGE



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MCGA



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# FLEA BEETLE CONTROLS

- Floating row covers
- Chemical pesticides
- Remove weeds in and around the garden.
- Use transplants rather than direct seed, seedlings are the most vulnerable.



# CUCUMBER BEETLES





# CUCUMBER BEETLE — DAMAGE

- Damages blossoms
- Damages fruit
- Are vectors for disease





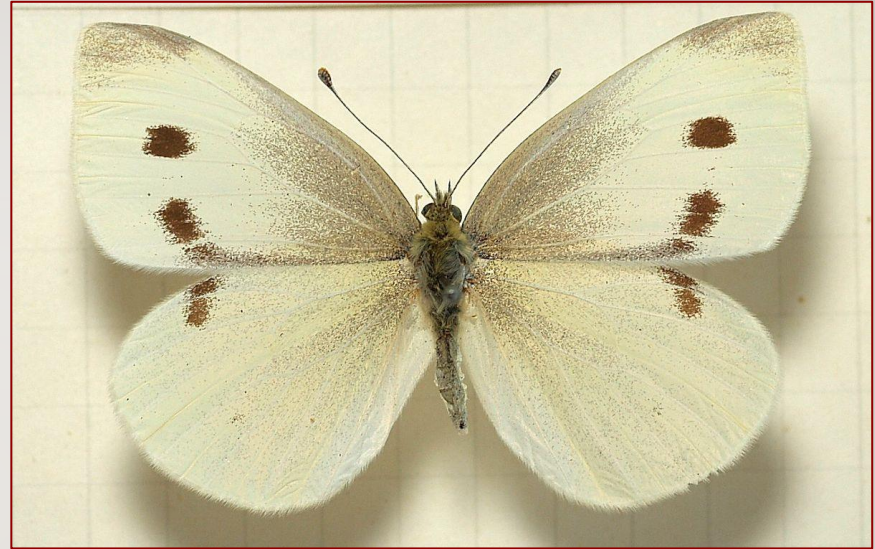
# CUCUMBER BEETLE — CONTROLS

- Use transplants rather than direct seed, seedlings most vulnerable
- Floating row covers
- Chemical controls
- Handpick and destroy eggs and bugs.
- Clean up vegetative debris in autumn to discourage overwintering beetles.



# CABBAGE FAMILY PESTS

- Cabbage Butterfly
- Soft, green larvae with light yellow stripes



# CABBAGE FAMILY PESTS

- Diamond Back Moth
- The second most damaging cabbage pest





# CABBAGE FAMILY PESTS — CONTROLS

- Chemical control
- Row covers
- Screen cages
- Hand-pick any caterpillars found on leaves.
- Pick and destroy any pupae found.
- Natural enemies of caterpillars include predacious beetles, parasitic wasps, and birds.



# CABBAGE FAMILY PESTS — CONTROLS

- Chemical control
- Row covers
- Screen cages





# LEAF MINER

- Larvae mine between upper and lower leaf surfaces
- Damage is caused by several pests
- Not usually a major pest





# Leaf Miner-Controls

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- Rotate crops
- Find and squash
- Row covers
- Encourage predators such as green lacewings and spiders



# HOW MUCH DAMAGE IS TOO MUCH?

- Decide what you can live with
- If you have plant specific needs, more intensive entomological research may be necessary
- Look at all garden practices when decide what course of action to take
- Take said action and review results



# BEFORE YOU APPLY PESTICIDES

- Visit a Master Gardener
- Visit Hortsense <http://hortsense.cahnrs.wsu.edu/>
- Visit PNW Insect Management Handbook  
<https://pnwhandbooks.org/insect>
- Read up on Pesticides on WSU Fact Sheet #9  
<https://extension.wsu.edu/king/gardening/fact-sheets/>





# A CAUTIONARY TALE

(NOT ALL PESTICIDES WORK OF ON ALL BUGS)



Courtesy of the National Pest Management Association / Tom Myers



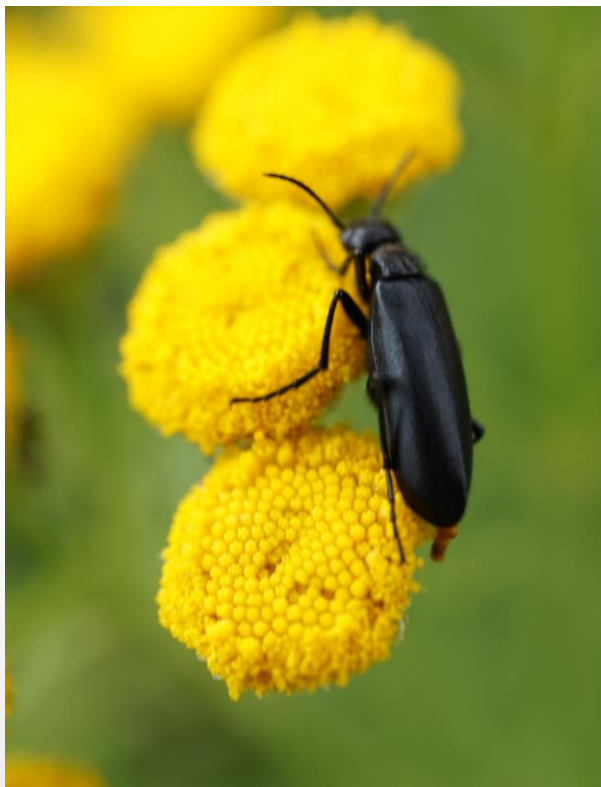
# BENEFICIAL BUGS

# HOW TO HOST BENEFICIALS

- By being a good host to beneficial insects, spiders, and mites by providing a good diversity of local, native flora.
- Instead of buying beneficial insects, it is more effective and sustainable to create a garden habitat that will allow them to colonized naturally.
- Reduce pesticide use.







# HOW TO HOST BENEFICIALS

- Plant a variety of flowering ornamentals, herbs, and vegetables. Mix in native flora.
- Dill, oregano, thyme, cilantro, yarrow, fennel, milk weed,



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# LACEWING LARVA AND APHID MIDGE







# BENEFICIAL NEMATODES



# WSU HORTSENSE

## HTTP://HORTSENSE.CAHNRS.WSU.EDU/

[Hortsense Home](#) | [Hortsense fact sheets](#) | [Natural Enemies & Pollinators](#)

### *Natural Enemies & Pollinators*

[Praying Mantis](#)  
[Predatory Bugs](#)  
[Predatory Beetles](#)  
[Earwigs](#)  
[Lacewings](#)  
[Snakeflies](#)  
[Predatory Flies](#)  
[Predatory Thrips](#)  
[Ants](#)  
[Stinging Wasps](#)  
[Predatory Mites](#)  
[Spiders](#)  
[Harvestmen](#)  
[Centipedes](#)

WSU Extension Presents

## Hortsense



*Dr. David G. James provided the content and images for the Natural Enemies & Pollinators category.*

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# PNW INSECT MANAGEMENT HANDBOOK

## [HTTPS://PNWHANDBOOKS.ORG/INSECT](https://pnwhandbooks.org/insect)

### Insect Management Handbook



Share This:   Print-friendly version: 

This handbook is intended as a tool for making decisions regarding the control and management of important insect pests in the Pacific Northwest. Originally, it was written for commercial growers, county extension agents, consultants, field and nursery staff, and chemical industry representatives. In recent years we have added sections that are useful to Master Gardeners and homeowners. [More about the PNW Insect Management Handbook](#)

Quick find: Crop pests



Apply

Enter a few letters of a crop name to find associated pests

Reset

MCGA



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# PESTICIDE USE REMINDER

- Use pesticides with care. Apply them only to plants, animals, or sites as listed on the label. When mixing and applying pesticides, follow all label instructions. It is a violation of the law to disregard label directions.
- Store pesticides in their original containers and keep them out of the reach of children, pets, and livestock.





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