

Integrated Pest Management

A process used to solve all kinds of pest problems, while minimizing risks to people and the environment.

Integrated Pest Management considers:

- prevention and management – not eradication
- the gardener's goals and tolerance for pests
- the impact of the pest and the control method on human health and the environment
- available, research-based information
- all pest management strategies and tools

The Heart of IPM

- Good Gardening Practices
 - preventing problems
- Observation
 - monitoring to catch problems early!
- Identification
 - are you fighting the right fight?
- A Gardener's Tolerance
 - how important is this?
- Management Choices
 - use the right tool(s) for the job

Good Gardening Practices

- Soil practices
- Focus on the plants
 - Characteristics
 - Quality
 - Methods
- Water regimen
- Resources

Observation

- Asking questions
- Visual
- Trapping
- Resources

Identification

Abiotic (environmental)

Weather: heat, cold, wind, or water
Poor growing conditions
Nutrient deficiency or toxicity
Mechanical damage
Pesticides

vs.

Biotic (living)

Insects and mites
Slugs and snails
Fungi
Bacteria
Viruses
Vertebrate pests

Types of insects

Understanding life cycles

Getting to know the differences

Hail

Fungus

Nutrient deficiency

Over-watering

Scale

Spider mites

Virus

Caterpillars/loopers

Finding the likely suspects

Resources

A Gardener's Tolerance

Pest characteristics

Value of plants (\$\$ and sentimental)

Time constraints

Cost of management

Impact of available controls

Personal gardening philosophy

Plants you want to keep or buy

Plants that are too much trouble

Management Strategies

Cultural Control Methods– Prevention and Maintenance

Plant choice

Resistant varieties

Rotation

Sanitation

Weeding

Mulching

Physical Control Methods

Barriers
Hand picking
Water jet
Pruning
Traps
Weeding
Do nothing!

Biological Control Methods

Natural enemies

Lady beetles (ladybugs)	Rove beetles Spiders	Bats
Lacewings	Wasps	Birds
Ground beetles (carabids)	Tachinid flies	Snakes
Hover flies	Nematodes	Toads/Frogs

Building the Insectary – Conservation

Diversity – increases numbers and species

Height	color	season	form
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Food

Carrot family	Aster family
Dill	Asters
Fennel	Sunflower
Coriander	Daisies
Mustard family	Yarrow
Rock cress	Grasses
Alyssum	Blue fescue
Broccoli	Idaho fescue
Cauliflower	Roemer's fescue

Shelter

Where to plant
Cover crops
Insect hotel

Protection from pesticides

Targeted applications/Drift control
Avoid spraying soil
Treat non-blooming areas/In non-blooming seasons
Treat when pest is active/present

Building the Insectary – Augmentation

Buy/Release/Spray

Chemical Control Methods

Redesign problem landscapes
Reduce the need for controls
Replace with least toxic methods

Best practices

Narrow-spectrum products
Not when plants are blooming
Read and follow label directions
Wear protective clothing
Dispose of properly

Nature-based (insect and disease) controls

Synthetic pest (insect and disease) controls

Working with MG clients

Case Studies

Blossom End Rot

- Calcium deficiency causes cell collapse
- San Marzano and other paste tomatoes are more likely to experience it
- During rapid growth phases, plants need more calcium
- Symptoms noted when excess nitrogen is applied
- Occurs more frequently in extreme heat
- If soil moisture levels fluctuate, calcium transport within the plant is affected

Dandelions in the lawn

- Dandelions thrive in a wide variety of soil types, pH, and conditions
- Soil compaction favors weed growth
- Dandelions have deep, fleshy tap roots, lawn grasses have fibrous roots
- Dandelions are most active in the summer
- Long, broad leaves photosynthesize efficiently
- One dandelion plant can produce 2,000 seeds in one year
- The leaves are high in calcium, potassium, and iron
- The roots have a turnip-like flavor

Azalea lace bug

- Some azalea varieties appear to be resistant
- Eggs are embedded under lower surface of leaf
- First generation hatches in mid-May, second in July (it appears)
- Drought stressed plants are more susceptible to lace bug attack
- Lace bugs have natural enemies, including lacewing larvae, lady beetles, and spiders
- Damage can be mistaken for spider mite damage; both have piercing/sucking mouthparts

Leaf miners in spinach/chard/beets

- Miners overwinter in soil as pupae
- After eggs are laid, maggots burrow into leaf between layers
- Eggs are white and laid under the leaf
- After feeding on leaf, miners drop to soil to pupate for 10-25 days. 2 to 3 generations per year
- Weeds such as chickweed, pigweed, plantain, and lambsquarters are also attacked
- Parasitic wasps and other natural enemies attack leaf miners.

Apple Scab

- Scab spores over-winter on leaves and fruit left on the ground
- Spores are produced during moist spring periods and spread by the wind
- A thick tree canopy favors this disease
- Flower buds and new leaves are most susceptible
- Immature fruit is more susceptible than mature fruit (though both can be infected)
- Red Delicious, Granny Smith, and Jonathan apples are more susceptible than others
- Scabby fruit may crack and lead to secondary infections

W A P A X S C X H S A W P N B
S R E N E D R A G L T L U I O
C H E M I C A L A N F U O N B
P X X A S C Q C G Z R L A O S
C R U R G A I E T L O N H I E
D P E B D S Q C S G H P A T R
V O M V Y E E Z I A I U T C V
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E Z I I B L T P L R J X I F E
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B R N W O E G M G L N F D X S
D V P N Q R D L E U Z T D S S
O J S S T N E I L C X Y J C V

IPM Word Search

Action	Disease	Observe
Biological	Gardeners	Options
Chemical	Identify	Physical
Clients	Insect	Prevent
Cultural	Master	Slug

Resources

OSU Extension Garden Calendar

search: OSU garden calendar

Robin Rosetta (insects)

OSU Nursery Extension, Research and Education (Facebook and Twitter)

search: PNW IPM

Jay Pscheidt (diseases)

PNW Plant Disease Management (Facebook)

Plant Clinic Monthly highlights

search: "OSU plant clinic year"

PNW Plant Management Handbooks – online

search: PNW pest management handbooks

<http://pnwhandbooks.org>

UC IPM online

Identification, damage, life cycles, management strategies

Key to nutrient deficiencies in vegetable crops

search: PNW key to nutrient deficiencies

WSU Landscape Plant Problems

Amazon

Natural Enemies Handbook

University of California

Common natural enemies guide

search: natural enemy pocket ID guide

Xerces.org publications

fact sheets, books, newsletter

The Meadowscape Handbook

West Multnomah County Soil and Water Conservation District

