Integrated Pest Management

for UC Master Gardeners

UC IPM | UNIVERSITY OF CALIFORNIA Agriculture and Natural Resources | Statewide Integrated Pest Management Program

Overview

About UC IPM

Concepts of IPM

Common Indoor & Garden Pests

Understanding Pesticides and Reading Labels

UC IPM Resources

What is UC IPM?

Making ecosystem-based integrated pest management
THE way Californians manage pests

- **UC IPM Statewide Program**
  - Housed within UC ANR
  - Engage with various stakeholders throughout the state on IPM; advisors and staff
  - Make sustainable pest management information accessible to ALL Californians
  - Work with residents, growers and farmers, land managers, community leaders, and other pest management professionals prevent and solve pest problems with methods that pose minimal risks to people and the environment

About us

- **UC IPM Urban & Community Unit**
  - Unit within UC Statewide IPM Program
  - Focus on pests and people in urban (non-agricultural) areas
  - Seek to educate structural & landscape pest control professionals, retail nursery & garden centers, public agencies, UC Master Gardeners and the general public
    - MGs play a critical role in helping UC IPM extend its information and reach!
  - Offer online pest management resources, interactive tools and databases, newsletters, trainings, webinars, etc.

Indoor & Garden Pests

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Aphids

ID

- Look for curled leaves, shed skins, honeydew or sooty mold, and under leaves or on new growth

Prevent

- Cover seedlings
- Monitor regularly
- Control ants; protect natural enemies
- Remove weeds
- Limit excessive nitrogen applications

Control

- Natural enemies
- Spray strong stream of water
- Prune out infested plant parts
- Insecticidal soap or oils are effective

Ground squirrels

ID

- Live in underground burrows and rarely climb trees or structures
- Go dormant twice a year (winter and summer)

Control

- Burrow fumigation in spring
- Poison baits in summer and fall
- Kill traps recommended over live

Peach leaf curl

ID

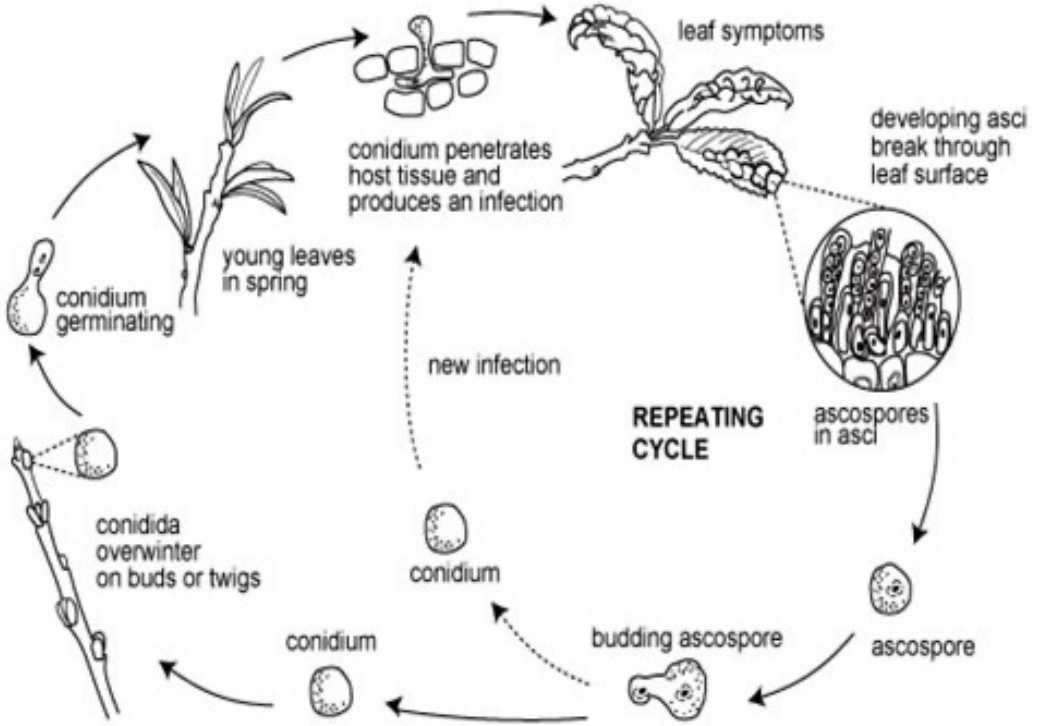
- Peach and nectarine trees
- Red areas on new leaves
- Leaves curl and distort

Prevent

- Use resistant varieties
- Yearly fungicide spray

Control

- Copper or chlorothalonil pesticide sprays



Ant management

ID

- Most live outside
- Some species prefer sweets, others proteins

Prevent/exclude

- Seal cracks and openings
- Store food properly and clean up trash or dirty dishes

Control

- Clean up with soap and water
- Insecticide sprays unnecessary
- Outdoor baits

Rat ID

- **Roof rats**
  - Good climbers with a tail longer than their head and body
  - Live and nest above ground in shrubs, trees, or dense vegetation

- **Norway rats**
  - Stocky, larger than roof rats
  - Build burrows along building foundations, beneath garbage, or in woodpiles

Rat management

Prevent

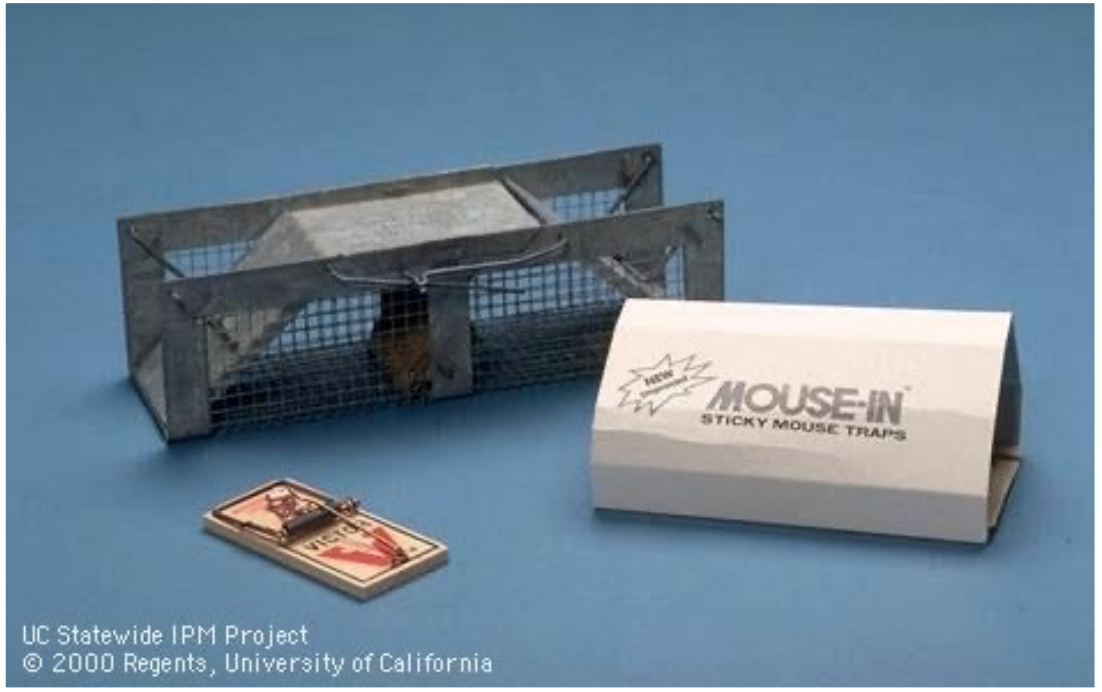
- Remove clutter and seal food and garbage
- Seal openings larger than 1/2 inch
- Door sweeps or weather stripping

Control

- Snap traps
- Avoid poison baits
- Can transmit diseases– don't touch with your hands

House mouse

- **ID**
  - 5 to 8 inches long
  - Musky odor
- **Prevent/exclude**
  - Seal openings larger than ¼ inch with steel wool or steel
  - Reduce clutter and nesting spaces
- **Control**
  - Snap traps
  - Can transmit diseases– don't touch with your hands



Concepts of Integrated Pest Management (IPM)

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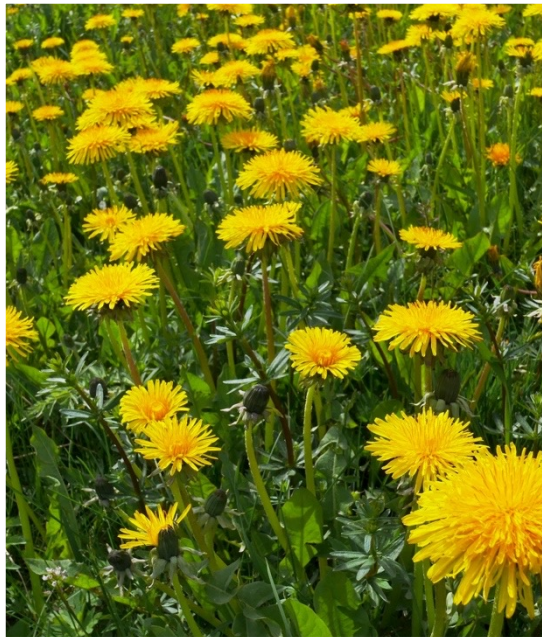
What is a pest?

- Something that annoys us or damages our plants, structures, or people

- **Plants** (weeds)
- **Invertebrates** (insects and mites)
- **Vertebrates** (squirrels, mice, birds)
- **Pathogens** (bacteria, viruses, fungi)




What is IPM?

Integrated pest management: A more sustainable way to manage pests

- Scientific and ecosystem-based approach
- Reduces risks to people and the environment
- Combination of practices for long-term management

Why choose IPM?

Provide long-term solutions- get to the root cause

Manage potential problems before they get out of hand

Many nonchemical management options

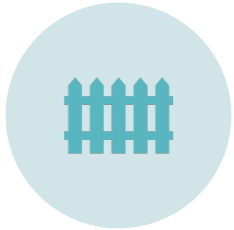
Eliminate unnecessary pesticide use

Better for people and environment

Components of IPM

IDENTIFICATION/ MONITORING

CULTURAL CONTROL



PHYSICAL/ MECHANICAL CONTROL

BIOLOGICAL CONTROL

CHEMICAL CONTROL

Identification / monitoring

- **Accurately identify the pest or problem**
  - Ask questions; know host plant
  - Essential to determine appropriate next steps or management
- **Monitor often for pests or problems**
  - Catch infestations or problems early
  - Determine if your management practices are working

Causes of damage

- There can me many causes for damage
- Not always caused by a pest!

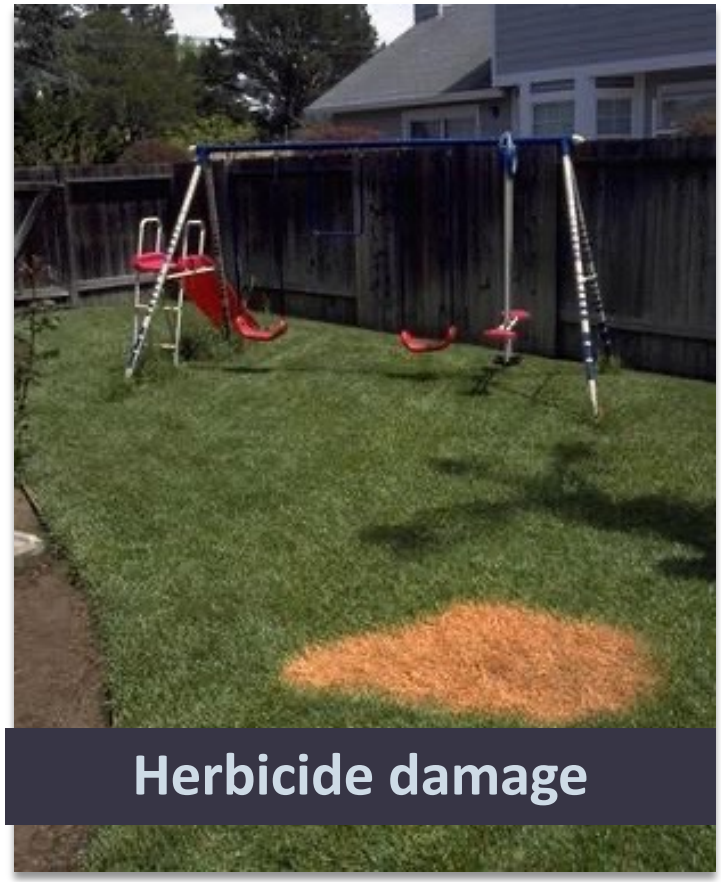
Living things (biotic, pests)

- Insects and other invertebrates
- Rodents and other vertebrates
- Disease causing organisms
- Weeds

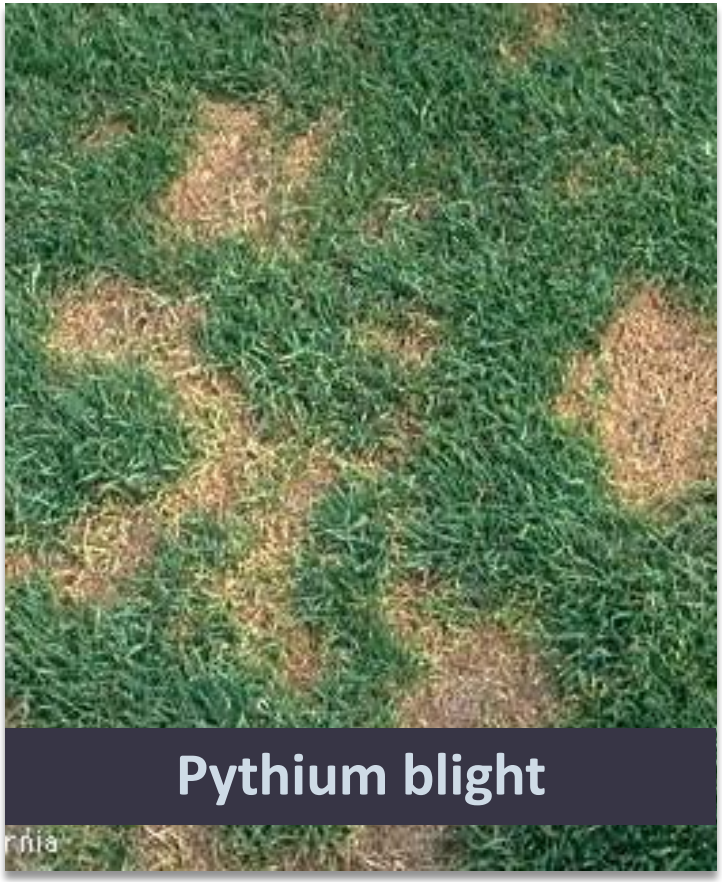
Nonliving things (abiotic, problems)

- Water and wind
- Sunlight and temperature
- Minerals and nutrients
- Pesticide or fertilizers
- Mechanical injury

Look-alike damage



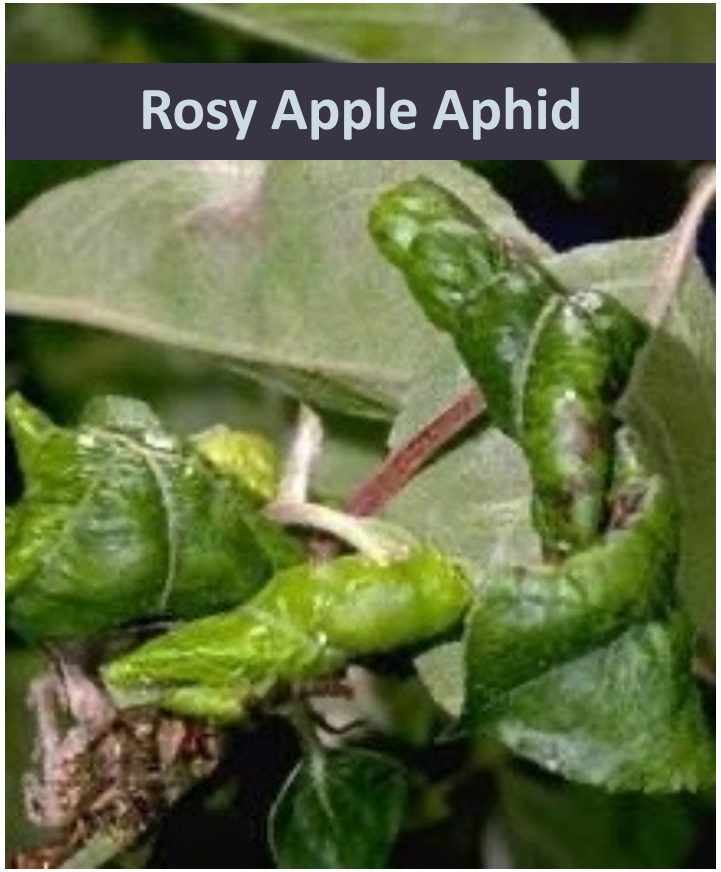
Herbicide damage

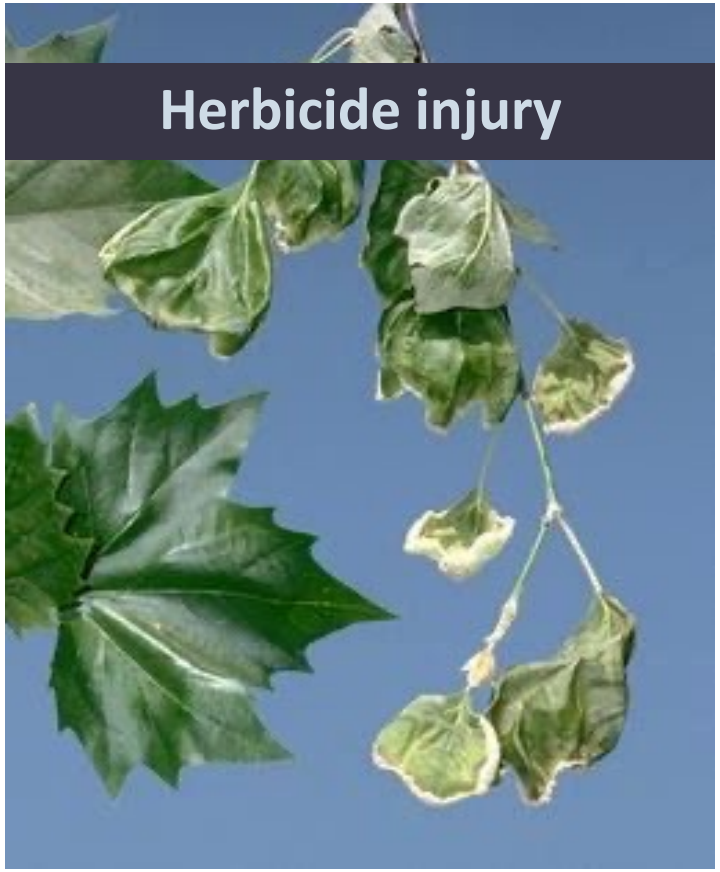


Pythium blight

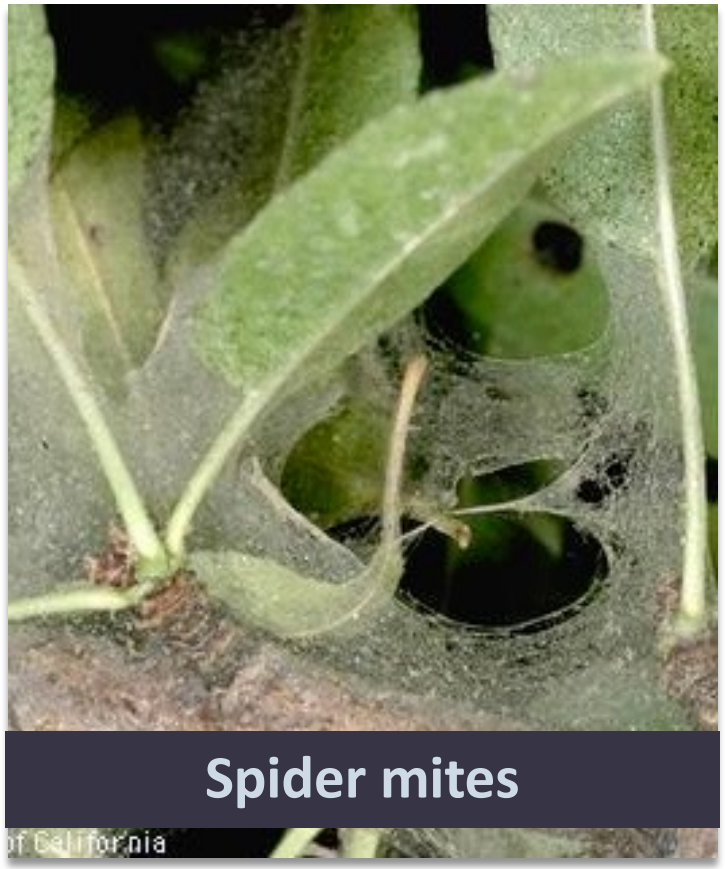
Fertilizer burn

Look-alike damage





Look-alike damage



Spider mites

Rose leafhopper

Greenhouse thrips

When to control?

- ***Threshold:*** *number of pests or level of damage for control to occur*
  - Commonly used in agriculture to determine when to manage a pest
  - Based on cost of control, value of crop, and impact on environment
- Varies from situation to situation
  - What can you tolerate?
  - What can the plant tolerate?

Cultural control

- **Practices that alter environment to make less suitable for pests to establish and reproduce**
- Proper horticultural care and site selection
  - Irrigation, soil, sunlight, resistant plants
- Sanitation
  - Clean up mummies, rotate crops, vacuum up crumbs, fix leaks

Physical / mechanical controls

- Kill or remove; block pests out
- Trapping
  - Trap to kill or monitor
- Exclusion
  - Door sweeps, screens, weatherstripping, caulk
  - Mulch, protective covers, fencing
- Removal
  - Pull/mow weeds, pick off diseased leaves, hose off insects
  - Vacuum up, flyswatters

Biological control

- Any activity of one species that reduces the adverse effects of another
- Natural enemies are the agents of biological control
  - Predators
  - Parasites/parasitoids
  - Pathogens

Types of natural enemies

- **Predators**: kill and feed on prey
  - Lady beetles, lacewings, reptiles, birds, spiders
- **Parasites/parasitoids**: live and feed inside of or on host
  - Parasitic wasps and flies
- **Pathogens**: infect and kill host
  - Bacteria, fungi, viruses


Predator


Pathogen


Parasitoid

Lady beetles

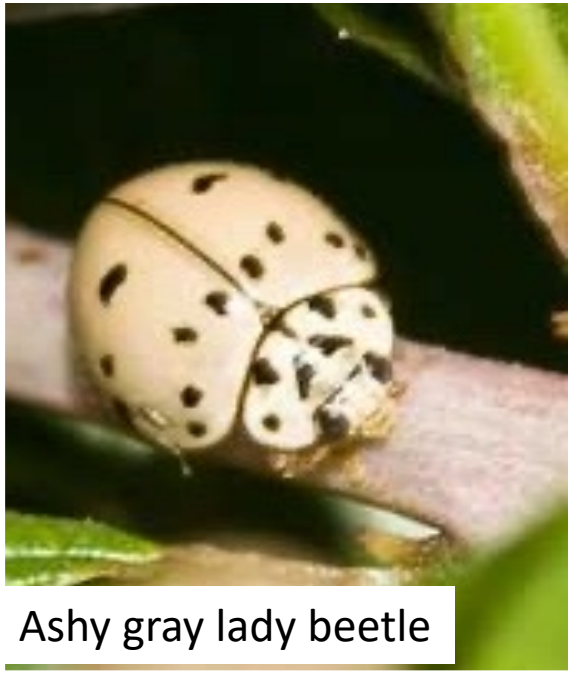
- Mostly generalist predators
  - Eat aphids, mites, psyllids, scales, and whiteflies


Eggs


Larva


Pupa


Multicolored Asian lady beetle


Ashy gray lady beetle


Convergent lady beetle

Lacewings

- Generalist predators
  - Aphids, mites, caterpillars, scales, mealybugs, psyllids, thrips
- Larva are most predaceous
- Brown lacewing adults are predatory, but only some green lacewing adults are


Green lacewing adult


Green lacewing eggs

Lacewing larva


Brown lacewing adult

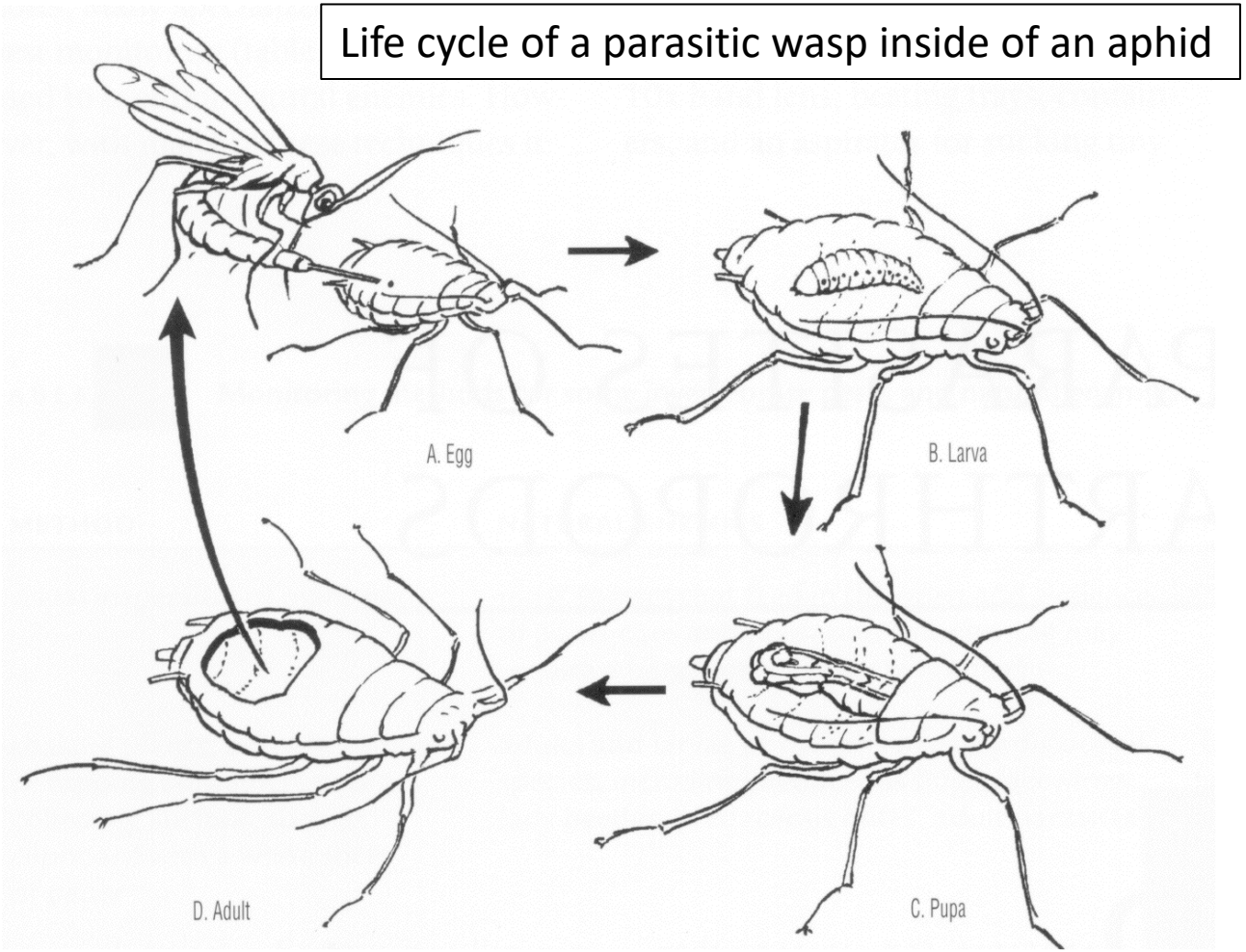
Syrphid flies

- Predators
- Adults resemble bees and feed on pollen and nectar
- Larvae feed on aphids and mealybugs

Parasite/parasitoids

- Live and feed in or on a host/prey
- Kill their host
- Mostly wasps and flies

Life cycle of a parasitic wasp inside of an aphid




Tachinid fly eggs
UC Statewide IPM Project


Aphidius species wasp
© 2001 Regents, University of California


Hyposoter exiguae wasp
© 2000 Regents, University of California


Trichogramma species wasp
© 2000 Regents, University of California

Signs of parasitization

- More obvious to see than the parasitoids themselves
- Parasitized hosts or eggs often discolored, darker than normal
- May see pupal cases
- Exit holes chewed by emerging parasites

Black parasitized scales


Dark parasitized egg


Mummies/exit holes


Pupal cases on caterpillar

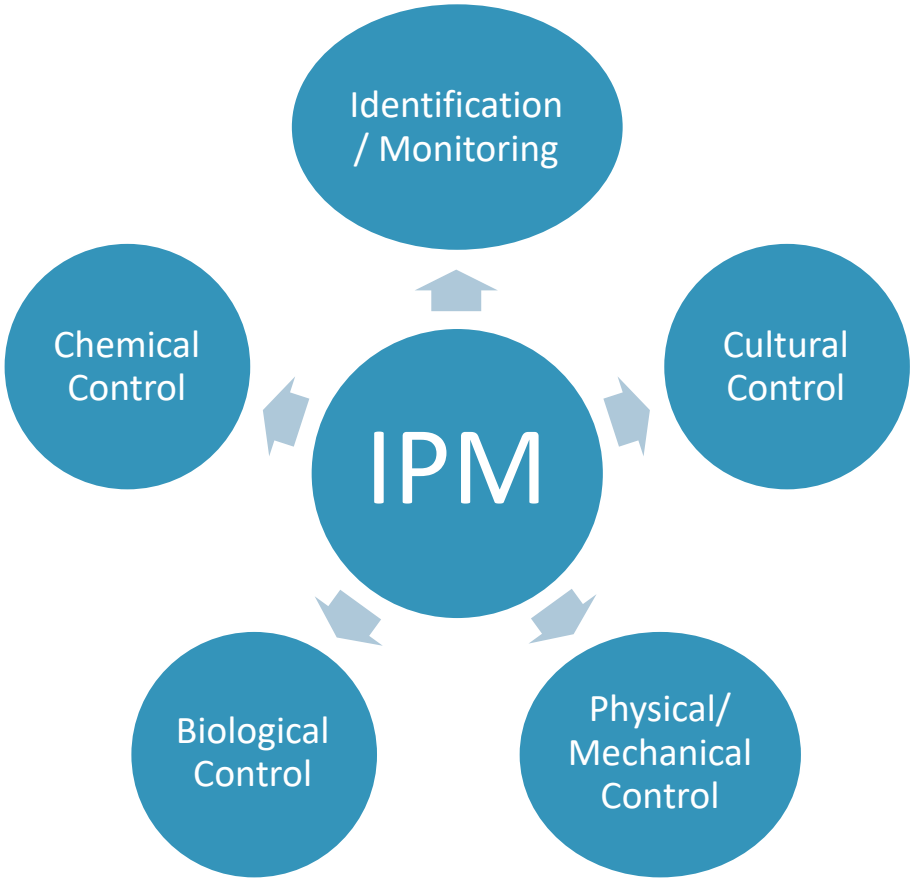
Protect natural enemies

- Important component of IPM!
- Occur naturally in gardens and landscapes
  - Some can be purchased
- Protect/support natural enemies:
  - Reduce use of pesticides
  - Provide pollen, nectar, and water
  - Control ants

Chemical control

- Pesticides can be important in IPM
- Make sure you accurately ID pest
  - Timing & type of chemical control
- When to use:
  - Nonchemical controls ineffective
  - Severe infestation
  - Public or structural concern
- Use less toxic pesticides as needed

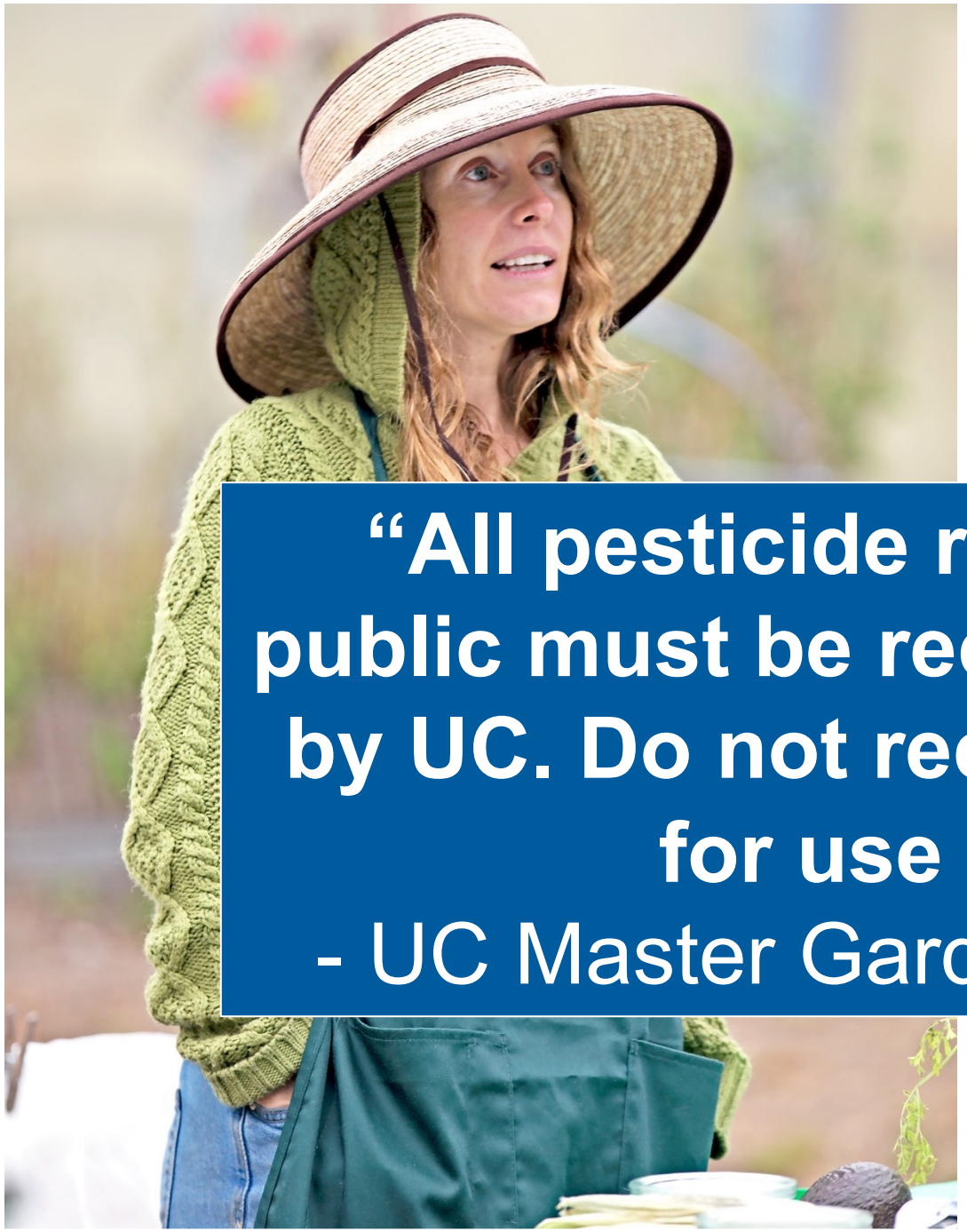
IPM Process



1. Prevention and monitoring
2. Accurately identify the problem or pest
3. Use cultural, mechanical, or biological control methods
4. Monitor/assess effectiveness
5. Use chemical control if needed
6. Prevention and monitoring

Why are we talking about pesticides?

- Clientele use pesticides often to control pests
- Lack of public understanding
- Safe and effective use
- Minimize risk of harm



How to talk about pesticides as UC MGs

- Use IPM approach

“All pesticide recommendations to the public must be recommendations published by UC. Do not recommend home remedies for use as pesticides…”

- UC Master Gardener Handbook, page 222

What are pesticides?

- Any substance intended to kill, control, prevent or repel pests, or to reduce the problems they cause
  - Can be synthetically made or naturally derived, including homemade or “natural” remedies

Pesticide types

Herbicides

Insecticides

Fungicides

Molluscicides

Antimicrobials

Rodenticides

How can you tell?

- **Pesticidal claim**
  - “Kills 158 listed insects”
  - “Kills 99.9% of germs”
- **EPA registration number**
  - Most all pesticides must be registered by EPA
- **Active ingredients listed**
- **Signal word**
  - CAUTION, WARNING, DANGER

What's in a pesticide?

- **Active ingredients (AI)** are the materials that affect the target pest

- **Other (inert) ingredients** are materials added to a pesticide to improve its efficacy, ease of application, and shelf-life

Pesticide registration

Most pesticides are registered by the U.S. EPA and carry EPA Registration Numbers
Must submit safety and efficacy data to EPA

To be sold and used in CA, most must also be registered with CA Department of Pesticide Regulation (DPR)

Some products & active ingredients are ***exempt*** from EPA registration and CDPR:

"minimal risk" pesticides. (Ex. Peppermint oil, citric acid)

USDA National Organic Program (NOP) determines ***organically acceptable*** pesticides. These are often derived from natural products such as plants or minerals (including petroleum oil), but not always. Some have the OMRI logo or "for organic gardening" language, but not all do

How do pesticides work?

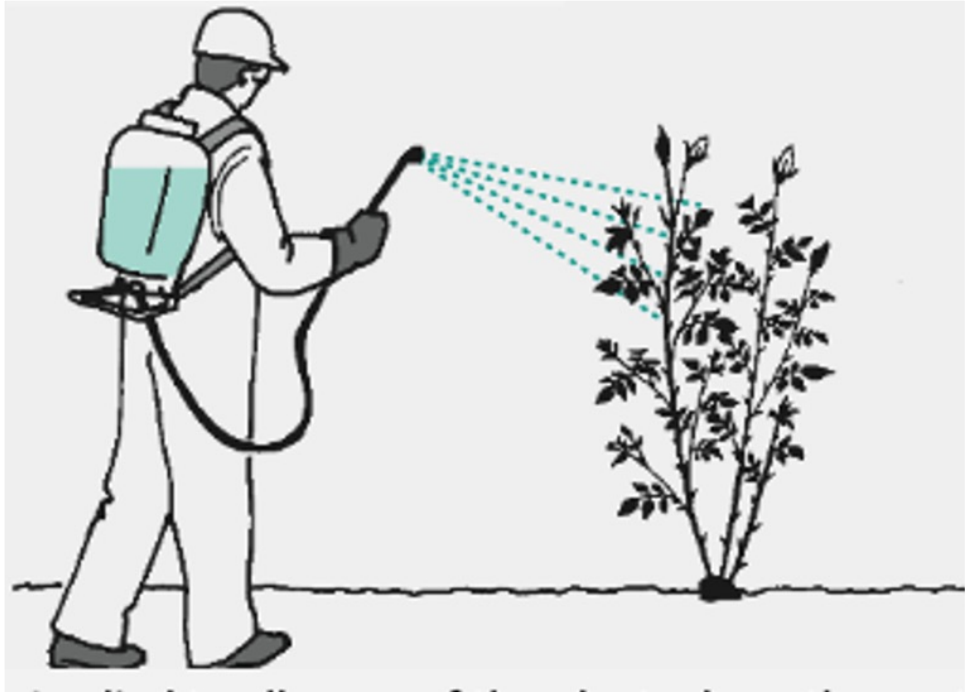
- Important in understanding how to use/apply effectively
- Many ways they can work:
  - Selective vs broad-spectrum
  - Contact vs systemic
  - Single vs multi-dose
  - Insect growth regulators
  - Plant growth regulators
  - Pheromones

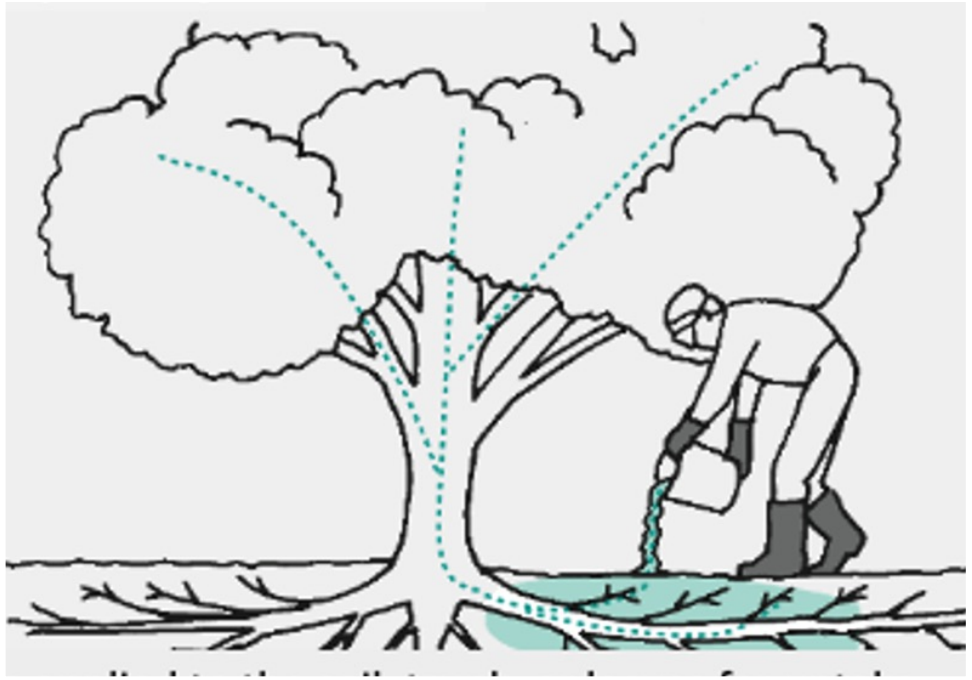
Selective vs broad-spectrum

- ***Selectivity****: the range of organisms killed or injured by a pesticide's active ingredient*

- **Broad-spectrum pesticides** kill a wide range of pests
  - Spinosad, pyrethrins, chlorothalonil, glyphosate

- **Selective pesticides** kill only a targeted group of pests
  - Potassium salts of fatty acids, *Bacillus thuringiensis* (Bt), dicamba





Contact vs systemic

- ***Residual:*** *remains effective for a period of time after application*
- **Contact pesticides** kill or affect pests that come in direct contact with or feed on the product
  - No residual control
- **Systemic pesticides** are absorbed by plants and moved to the leaves, roots, seeds, and stems
  - Provides residual control

Pesticide Toxicity

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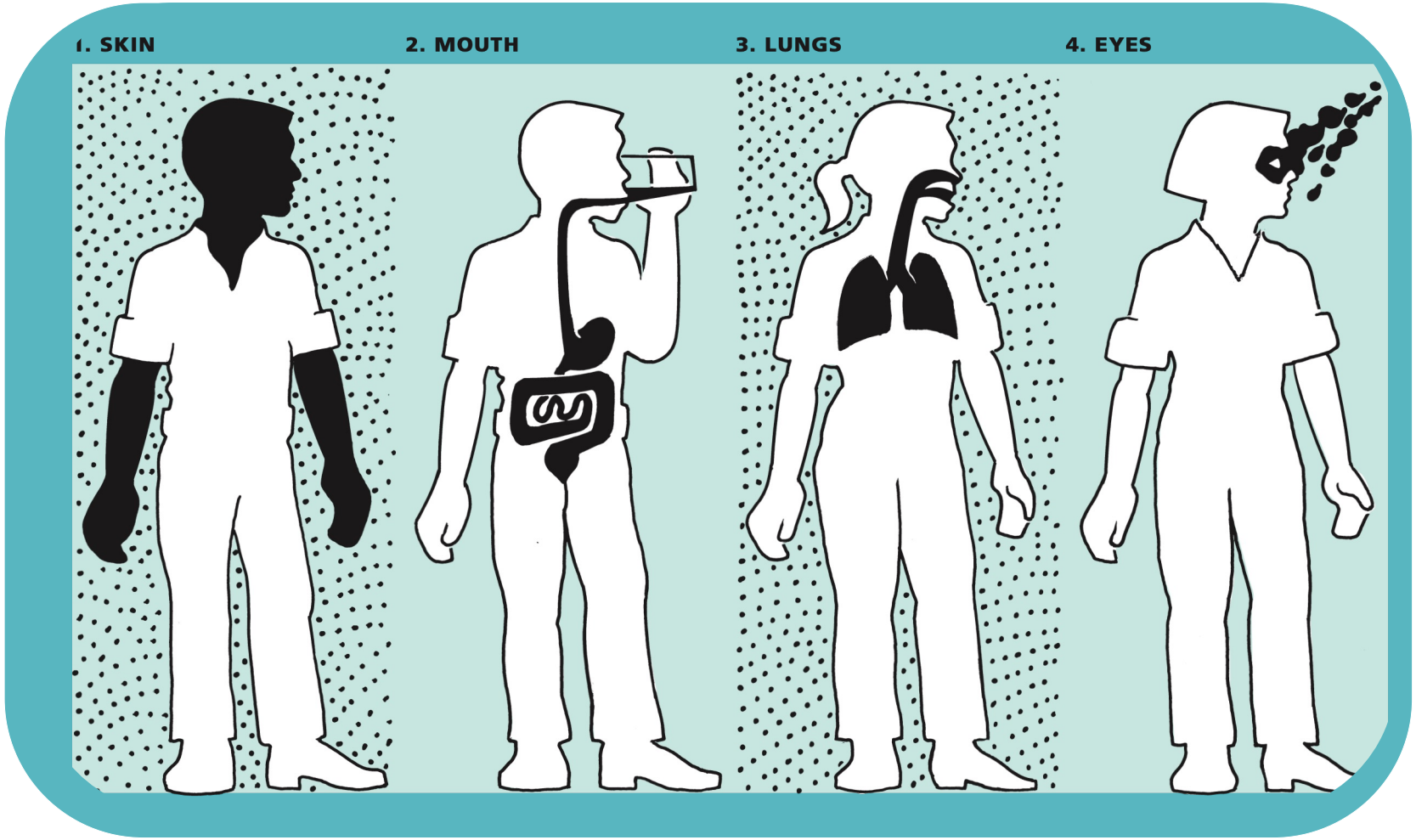
Pesticide Toxicity

- **Toxicity:** ability of a chemical to injure a person, animal, plant, or other organism
- All chemicals are toxic to some organisms to some degree
  - Pesticides are designed to be toxic; natural materials can also be toxic
- Toxicity varies among organisms

Exposure / Routes of entry



Acute toxicity

- The ability of a chemical to cause harm in a short period of time
  - Burning, itching, pain, coughing after pesticide exposure
- Indicated by signal words (CAUTION, WARNING, DANGER) on the pesticide label
- Based on LD-50 measurements of the active AND inert ingredients
  - LD-50 is the lethal dose to kill 50% of exposed individuals
  - Manufactures must study oral, dermal, and inhalation toxicity

Signal words

CAUTION	**Slightly toxic either orally, dermally, or through inhalation; causes slight eye or skin irritation.**
WARNING	**Moderately toxic either orally, dermally, or through inhalation; causes moderate eye or skin irritation.**
DANGER	**Can cause severe eye damage or skin irritation.**
DANGER-POISON	**Highly toxic by any route of entry into the body.**

Routes of Exposure	Toxicity Category I	II	III	IV
Oral LD_{50}	Up to and including 50 mg/kg	50-500 mg/kg	500-5,000 mg/kg	>5,000 mg/kg
Inhalation LC_{50}	Up to and including 0.2 mg/l	0.2-2 mg/l	2-20 mg/l	>20 mg/l
Dermal LD_{50}	Up to and including 200 mg/kg	200-2,000 mg/kg	2,000-20,000 mg/kg	>20,000 mg/kg
Eye Effects	Corrosive corneal opacity not reversible within 7 days	Corneal opacity reversible within 7 days; irritation persisting for 7 days	No corneal opacity; irritation reversible within 7 days	No irritation
Skin Effects	Corrosive	Severe irritation at 72 hours	Moderate irritation at 72 hours	Mild or slight irritation at 72 hours
Signal Word	DANGER POISON	WARNING	CAUTION	CAUTION
Adapted from 40 CFR Part 156.				

All pesticide toxicity values, including the LD_{50}, can be found on the product's Material Safety Data Sheet (MSDS). Pesticide labels and MSDS can be obtained from retailers or manufactures. In addition, most products also have information that can be found on the Internet.

Personal Protective Equipment (PPE)

- Personal protective equipment is meant to minimize your exposure to pesticides
- The label may state what PPE is necessary
  - May just say not to get on skin; don’t breathe in
- In general, always wear chemical-resistant gloves, long-sleeve shirts, long pants, and closed–toe shoes

Reading a Pesticide Label

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Why should you read the label?

- To understand what the pesticide is, how to use it, where to use it, and what pests it can be used on
- To learn about any safety risks or environmental hazards
- It is a legal document– you must follow the label!

Parts of a pesticide label

- Product and brand name
- Active ingredients
- Precautionary statements
- Signal word
- US EPA registration
- Storage and disposal
- Directions for use
- Site and pest listed

What to look for when choosing a pesticide

- Pests controlled
- Signal word & environmental impacts
  - Hazards to people, pets, pollinators, natural enemies, fish, water quality
- Packaging
  - Size and application type
- PPE
  - Gloves, respirator, goggles

Pesticide Label Reading Activity Worksheet

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Manufacturer:	
Product name:	
Active ingredient(s):	
Signal word:	
Is this product ready-to-use or a concentrate? How is it applied?	
What plant(s) can this product be used on?	
List three pests this product can be used for:	• • •
How often can this product be applied?	
What does the label say about Personal Protective Equipment (PPE)?	

When the label doesn't mention PPE, what protective clothing at minimum should you wear, according to UCIPM?

Some application types

Pesticide storage

- Follow label specific instructions
  - Cool, dry place
  - Locked cabinet
  - In original container
  - Sealed or closed
- Triple rinse mixing and application equipment before storing

STORAGE AND DISPOSAL

STORAGE: Store product in original container in a safe place.

DISPOSAL: If empty: Do not reuse this container. Place in trash or offer for recycling if available. **If partly filled:** Call your local solid waste agency or 1-800-CLEANUP for disposal instructions. Never place unused product down any indoor or outdoor drain.

PRECAUTIONARY STATEMENTS

HAZARDS TO HUMANS & DOMESTIC ANIMALS

CAUTION: Wash thoroughly with soap and water after handling.

ENVIRONMENTAL HAZARDS: Do not apply directly to any body of water. Do not contaminate water by cleaning of equipment or disposal of wastes.

NOTICE: Buyer assumes all risks of use, storage or handling of this product not in

Pesticide disposal

- **Excess diluted/mixed pesticides:** apply to plants/sites listed on label or take to household hazardous waste (HHW) site
- **Partially filled or unused pesticide containers:** take to HHW site
- **Empty pesticide containers:** place in trash or recycle if accepted in your area
- **Don't:** Flush down toilet or sink drains, dump in street gutter or outside, reuse containers
- Find HHW site
  - Info can often be found in MG office; city website
  - Call (**1-800 CLEANUP**) or look up at earth911.com

Less toxic pesticides

What are less toxic pesticides?

- Products that pose less risks to humans and the environment
- Often break down quickly in the environment; limited residual control
- Most are contact pesticides; good coverage is essential
- Usually signal word CAUTION or none

Pesticidal oils

- **Insecticide/miticide-** kills by smothering
  - Works best on soft bodied insects (aphids, mealybugs, whiteflies)
  - Requires good coverage; thoroughly cover insects don't just mist
- **Fungicide-** suppresses/smothers fungi and bacteria
- Read the label!
  - Sunlight or extreme temperature
  - May damage waxy plants, or change color of evergreens

Petroleum-based pesticidal oils

- Horticultural oil, mineral oil, supreme oil

- **Dormant oil-** for use on trees and woody plants before buds open in spring
  - Highly concentrated (mostly oil, less water)
  - Don’t use in summer; will kill leaves

- **Summer oil-** for use in summer, but can be used year-round
  - Very low concentration (more water, less oil)
  - Read label; some may not be used at temp. extremes

Plant-based pesticidal oils

- Neem oil, canola oil, rosemary oil, clove oil
- Botanical oils contain trace amounts of chemicals that are extracted and used as active ingredients: limonene, eugenol, azadirachtin, etc.
- Limited information on effectiveness

Pesticidal soaps

- **Insecticide-** kills insects by covering/smothering
  - Works best on soft bodied insects (aphids, mealybugs, whiteflies)
  - Requires good coverage; thoroughly cover insects don't just mist
- **Fungicide-** interferes with cellular processes of fungi and bacteria
- **Herbicide-** causes leaves to dry out and die
  - Doesn't kill roots; works best on young, small plants
- Some soaps may react to sunlight or extreme temperature, so read the product label

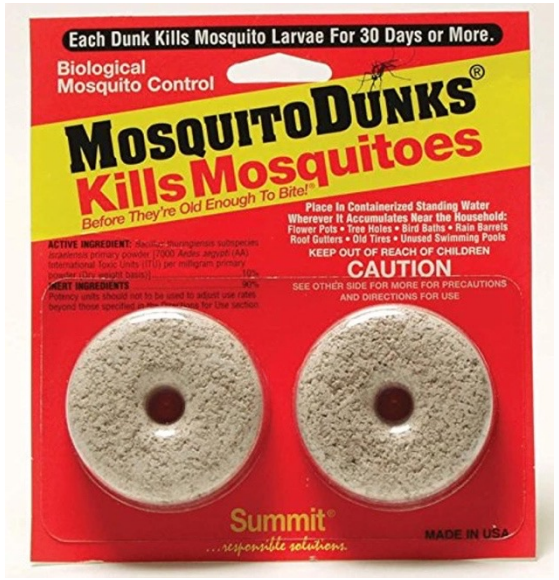
Pesticidal soaps

- **Potassium salts of fatty acids** (insecticide or miticide)
- **Copper octanoate** (fungicide)
- **Ammoniated soap of fatty acids** (herbicide)

Microbial pesticides

- Derived from microorganisms like bacteria, fungi, and viruses
- Good coverage essential

- **Active ingredients**:
  - *Bacillus thuringiensis var. kurstaki* and *aizawa*– for caterpillars
  - *Bacillus thuringiensis var. israelensis* – for mosquito, gnat, and fly larvae
  - Spinosad – for caterpillars, thrips, leafrollers and leaf miners



Other less toxic pesticides

- Insecticides:
  - **Borate** (Boric acid or borax)
  - **Pyrethrins** – from chrysanthemum flowers
- Fungicides:
  - **Copper formulations**
  - **Sulfur**
- Bait stations

Pesticide toxicity to natural enemies

Insecticide	Contact Toxicity	Persistence of Toxic Residue
Bacillus thuringiensis	None	None
Oils/Soaps	Moderate	None
Botanicals (pyrethrins/ azadiractin)	Moderate to high	Short
Spinosad	Moderate	Medium
Organophosphates/ carbamates/ pyrethroids	High	Medium to long
Imidacloprid: foliar spray	Variable: most natural enemies affected	Medium
Imidacloprid: soil applied or root/trunk injected	Bees, predatory beetles, and nectar-feeding parasites affected	Long

Misconceptions/biases

- Homemade products using household ingredients are not less toxic
  - Have not been tested for safety or effectivity; No instructions for use; high variability
  - UC MGs should not suggest making homemade pesticides

- Organic products are not always less toxic
  - Some organically acceptable active ingredients can still be harmful

- “Natural” or botanically derived pesticides are not always less toxic
  - Even naturally occurring compounds can be toxic to people, pets, environment

Wrap up

- IPM is a more sustainable way to manage pests; uses a combination of control methods
- Natural enemies a key part of IPM and should be protected
- All pesticides (and chemicals!) have the potential to cause harm; use less toxic products to reduce risks
- Always read and follow the pesticide label; wear PPE
- Rely on UC IPM website

UC IPM Resources

UC IPM website

ipm.ucanr.edu

Table 1. Summary of Herbicides for A

Herbicide	Trade na	ornamentals?	Available to home gardeners?
benefin	Balan 2.5	yes	no
benefin/oryzalin	Amaze Gr	yes	yes
benefin/trifluralin	Team	yes	no
bensulide	Bensume	no	yes
dithiopyr	Dimensio	yes	yes
ethofumesate	Poa Const	no	no
oryzalin	Surflan, W	yes	yes
oxadiazon	Ronstar	yes	no
pendimethalin	Pendulum	yes	turf only
pendimethalin/dimethenamid	Freehand	yes	no
prodiamine	Barricade	yes	yes
pronamide	Kerb	no	no
trifluralin	Vegetable	yes	yes
clethodim	Envoy	yes	no
ethofumesate	Poa Const	no	no
foramsulfuron	Revolver	no	no
pronamide	Kerb	no	no
sulfosulfuron	Certainty	no	no
trifloxysulfuron	Monumen	no	no
diquat	Diquat, R	n/a	yes
glufosinate	Finale	n/a	no
glyphosate	Roundup,	n/a	yes
nonanoic acid	Scythe	n/a	yes

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Understanding Pesticides

Integrated pest management (IPM) is a more sustainable way to manage pest problems. Methods used in IPM pose fewer risks to people, pets, nontarget organisms, and the environment. IPM involves the combination of control methods to achieve long-term pest management. These include non-chemical methods such as biological, cultural, and physical controls, but also chemical control using pesticides when needed. If one decides to use a pesticide, it is critical to understand how to appropriately choose and apply them in the safest and most effective way.

This document seeks to provide UC Master Gardeners with essential information for understanding, choosing, and using pesticides in the home, garden, or landscape and discussing them with clientele. Having this knowledge will allow you to better educate your community about pesticides. It will cover what pesticides are, reading a pesticide label, how pesticides fit within IPM, organically acceptable and less toxic pesticides, and resources for more information.

What is a Pesticide?

Pesticides are materials intended to control, prevent, kill, reduce, or repel pests. They can be made from natural or synthetic chemicals. The chemical in a pesticide that directly affects the target pest is called the **active ingredient** (examples: neem oil, glyphosate, pyrethrin).

There are many types of pesticides, and each is meant to be effective against specific target pests. The term "-cide" comes from the Latin word "to kill." Some common pesticide types include insecticides (insect killers), herbicides (weed killers), fungicides (fungus killers), and rodenticides (rodent killers). Pesticides also include repellents, disinfectants, flea and tick products, moss and algae killers, pool cleaning products, as well as homemade mixtures that are intended for use against pests.

Reading a Pesticide Label

A pesticide label contains essential information that users need to know in order to use the product in the most effective and safest way. Many consumers fail to read the label, which can result in increased exposure to the chemicals, ineffective control of the pest, environmental contamination, and hazards to **nontarget organisms**–fish, wildlife, pollinators, natural enemies, humans, and any other organisms that the product was not intended to harm or control. Pesticide labels are actually legal documents and must be read, understood, and followed. If you have a hard time finding or reading this information on the product label, you can find a product's associated label by searching the manufacturers online website.

Natural e

List by common name | List by order and family name | List by scientific name

Pest name
Adelgids
Aphids

Spotless lady beetle (ladybug)

Syrphid flies

PRINT

More...)

Su
to
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PESTS IN THE URBAN LANDSCAPE

Home, landscape, and structural pest news from the UC Statewide Integrated Pest Management Program

UC ANR

UCANR: Protecting California's natural resources

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Don't move homegrown fruits & vegetables off your property

Published on: December 5, 2023

Seven invasive fruit fly quarantines are in place throughout California. If you live within one of these quarantine zones, fruits and vegetables should not be moved off the property they were grown on. Quarantines are in place for the Mediterranean fruit fly, Oriental fruit fly, tau fruit fly, and Queensland fruit fly. Smuggled, illegally imported fruit is the most common pathway of fruit fly entry into California.

These fruit flies lay their eggs under the skin of many crops, making their detection difficult. Females of some species can lay 1,000 eggs in their lifetime. Once eggs hatch, larvae (maggots) feed on the inside of the fruit. Infested fruit drops to the ground where larvae leave the fruit to burrow into the soil to pupate. Numerous generations can occur each year.

Invasive fruit flies pose a major threat to California agriculture as they make fruit unfit for human consumption and damage a wide variety of crops from fruits to vegetables. In addition, they pose an economic burden to commercial growers in quarantine zones as they must treat all host fruit with an approved pesticide before sale or movement within or outside of the quarantine area. You can help prevent the spread of these invasive pests and reduce the risks they pose to commercial fruit and vegetable producers by not moving homegrown produce and cleaning up and disposing of dropped fruit.

Quarantine zones include:

Mediterranean fruit fly

- Los Angeles County, Leimert Park Area

Oriental fruit fly

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Archives — All Archives

- December 2023
- November 2023
- October 2023
- September 2023
- August 2023

In nurseries, any jumping worms that are

ewsletter

mping Worm

T Potterfield, Flickr

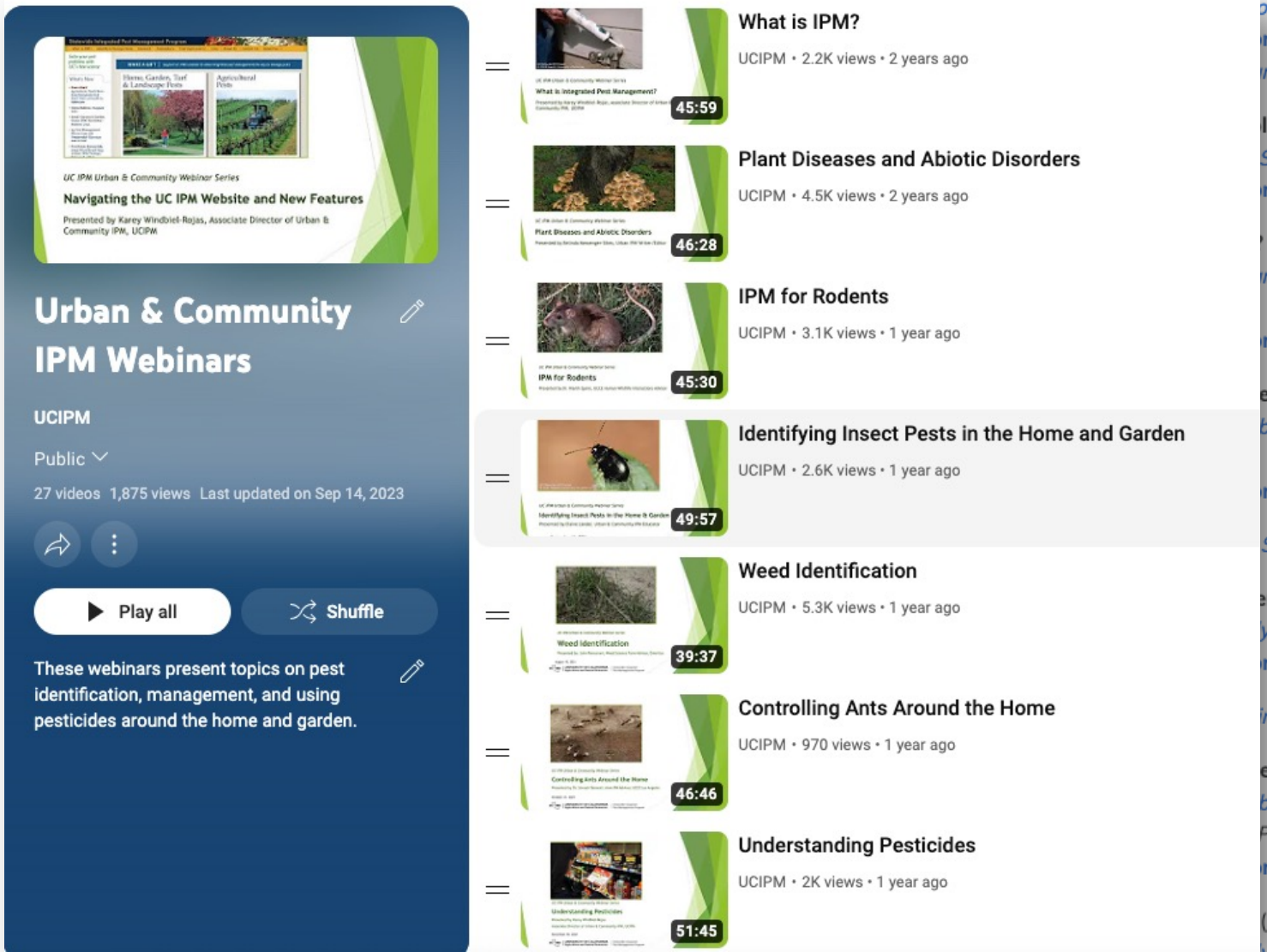
Figure 1. The jumping worm, *Amyntha agrestis*. The distinctive white band (clitellum) around its body near the head is circled.

Pixabay

Figure 2. A common earthworm,

ogram

Webinars



2023

Invasive Species Success Stories (August 17, 2023)
Presenter: Randall Oliver, Invasive Shothole Borers (ISHB) Communications Coordinator
Watch the recording on YouTube

Natural Enemies & Beneficial Bugs: What are they? (July 20, 2023)
on, Area IPM Advisor, San Diego county
n YouTube
ral Enemies & Beneficial Bugs Webinar

ld Pests (June 15, 2023)
Sutherland, Urban IPM Advisor, San Francisco Bay Area
n YouTube

(May 18, 2023)
rtinico, Human-Wildlife Interactions Advisor, Napa, Lake, and

n YouTube

ealybugs, Oh my! (April 20, 2023)
biel-Rojas, Associate Director for Urban & Community IPM/Area

n YouTube

Scales, and Mealybugs, Oh My Slides

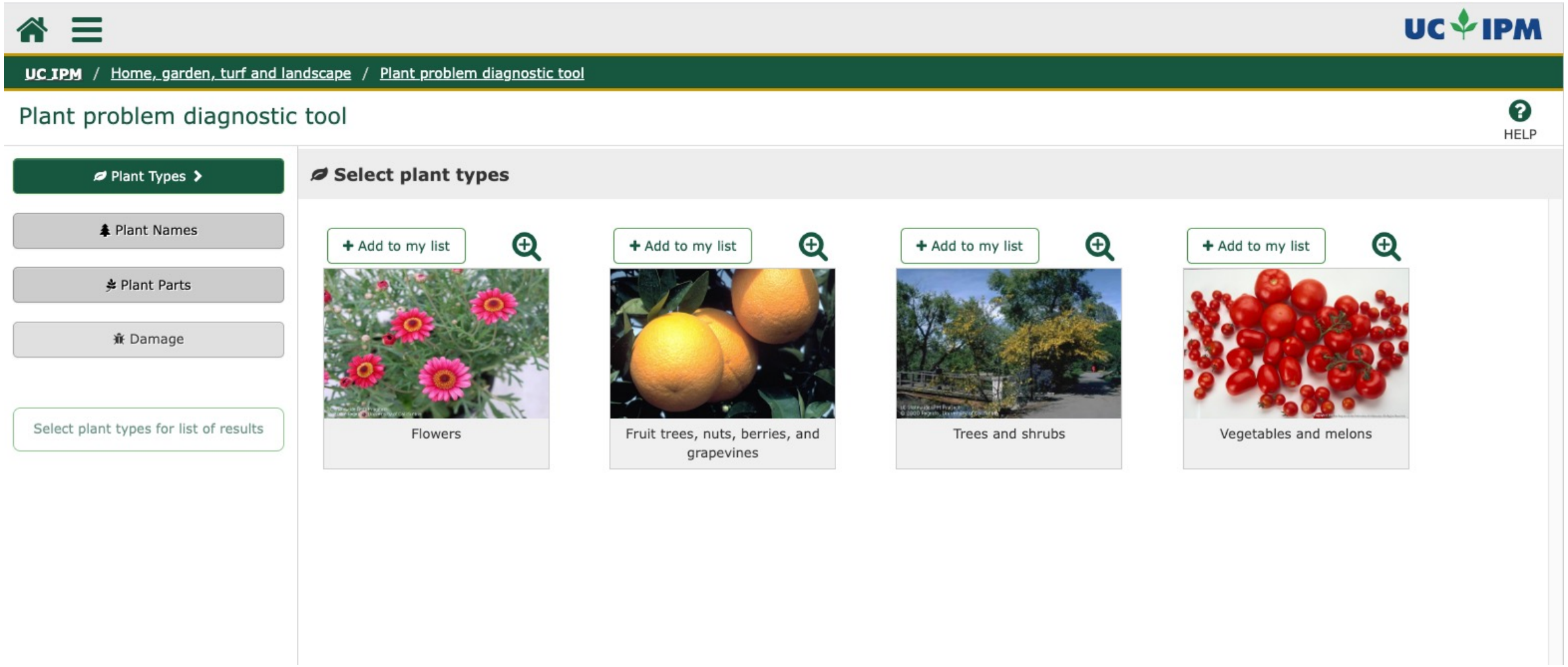
ems at Seeding (March 16, 2023)
yce, Urban and Community IPM Educator
n YouTube

ng Pest Problems at Seeding Slides

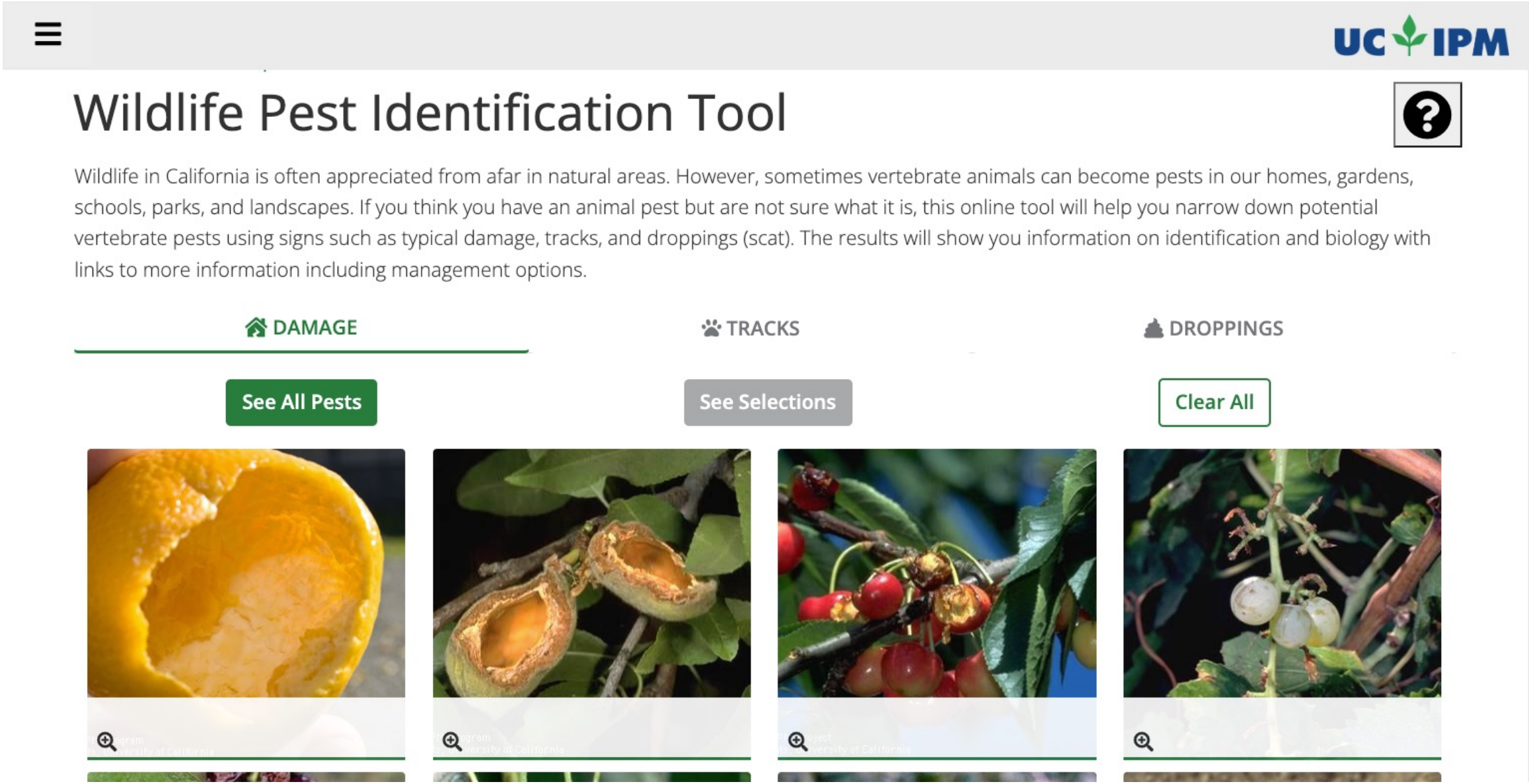
ests (February 16, 2023)
biel-Rojas, Associate Director for Urban &
PM Advisor
n YouTube

(January 19, 2023)

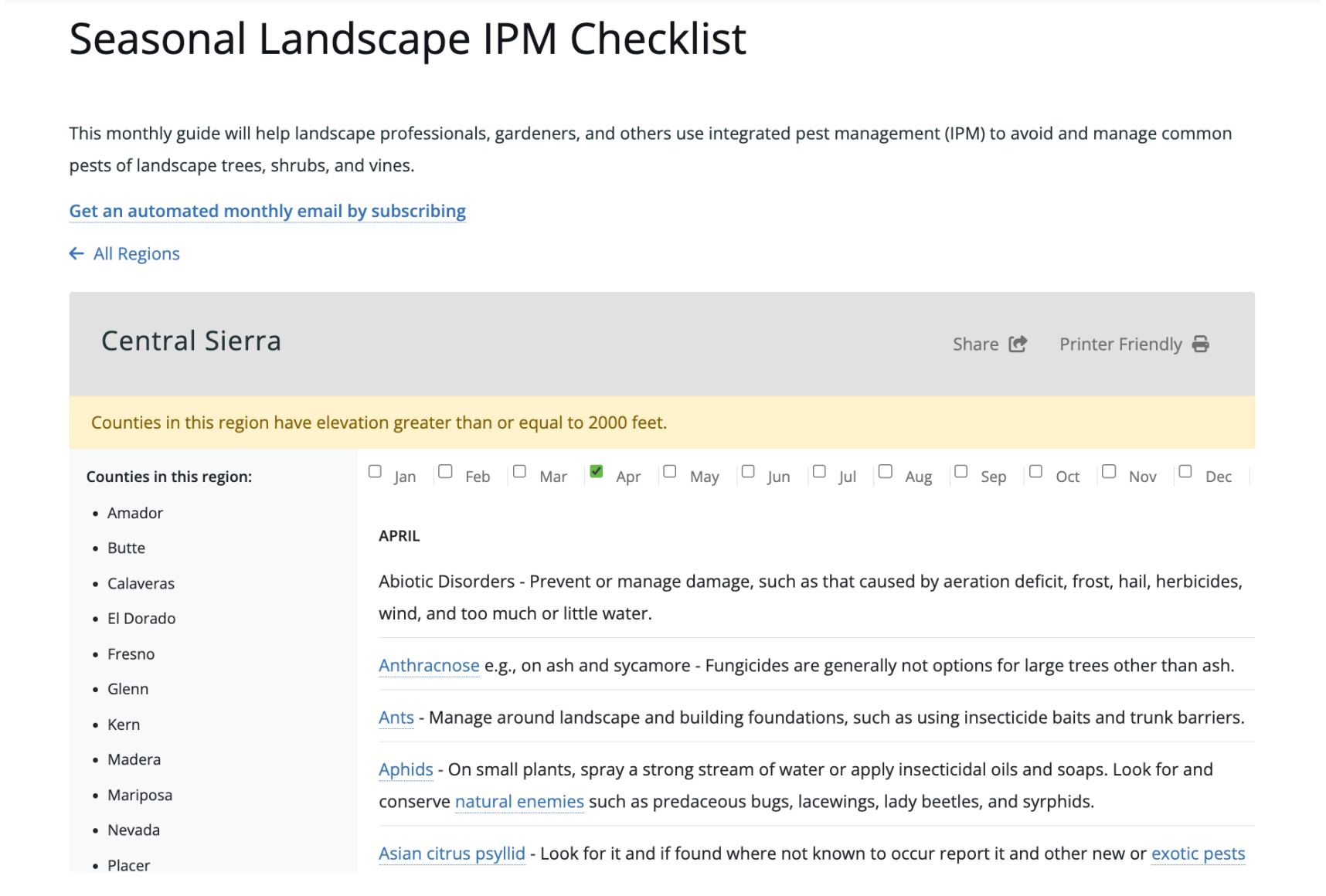
Plant Problem Diagnostic Tool



Wildlife Pest Identification Tool



Seasonal Landscape IPM Checklist



Seasonal Landscape IPM Checklist

This monthly guide will help landscape professionals, gardeners, and others use integrated pest management (IPM) to avoid and manage common pests of landscape trees, shrubs, and vines.

Get an automated monthly email by subscribing

← All Regions

Central Sierra

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Counties in this region have elevation greater than or equal to 2000 feet.

Counties in this region:

- Amador
- Butte
- Calaveras
- El Dorado
- Fresno
- Glenn
- Kern
- Madera
- Mariposa
- Nevada
- Placer

☐ Jan ☐ Feb ☐ Mar ☑ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☐ Nov ☐ Dec

APRIL

Abiotic Disorders - Prevent or manage damage, such as that caused by aeration deficit, frost, hail, herbicides, wind, and too much or little water.

Anthracnose e.g., on ash and sycamore - Fungicides are generally not options for large trees other than ash.

Ants - Manage around landscape and building foundations, such as using insecticide baits and trunk barriers.

Aphids - On small plants, spray a strong stream of water or apply insecticidal oils and soaps. Look for and conserve natural enemies such as predaceous bugs, lacewings, lady beetles, and syrphids.

Asian citrus psyllid - Look for it and if found where not known to occur report it and other new or exotic pests

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IPM for UC Master Gardeners

On This Page

The UC Statewide IPM Program provides resources to extend research-based knowledge and information on home horticulture, pest management, and sustainable landscape practices to the residents of California. These resources are geared towards UC Master Gardeners for use in outreach and educational events in their local communities. This information will help residents manage pests in gardens and landscapes, apply integrated pest management solutions, and access to IPM presentation and training materials.

Read more about integrated pest management for urban and community audiences.

Resources:

- IPM Home and Landscape
- Training Materials
- Request Quick Tips and Materials

Quick Links

- Pest Notes library
  - Recently updated or new titles
  - Pest Notes flyer (PDF)
- Quick Tips library
  - Quick Tips QR code poster in English (16x20 PDF)
  - Quick Tips QR code poster in Spanish (16x20 PDF)
- Search pests by plant host or pest category
- Plant problem diagnostic tool
- Ant key
- Home & Garden Pest Newsletter
- Household pests
- Natural enemies gallery
- Wildlife Pest Identification Tool

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Disclaimers

- *No endorsements of named products are intended, nor is criticism implied of products not mentioned. Always read and carefully follow all precautions and safety instructions provided on the pesticide container label, as well as any other regulations regarding the use of pesticides. Not following label directions, even if they conflict with information provided herein, is a violation of state and federal law.*
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- *Inquiries regarding nondiscrimination policies may be directed to UC ANR, Affirmative Action Compliance & Title IX Officer, University of California, Agriculture and Natural Resources, 2801 Second Street, Davis, CA 95618, (530) 750-1343.*

Thank you!

Karey Windbiel-Rojas, UC IPM
kwindbiel@ucanr.edu

Lauren Fordyce, UC IPM
lfordyce@ucanr.edu

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