A changing climate changes pests: UC IPM tools for California Naturalists

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

Background

Pest “any of the following that is, or is liable to become, dangerous or detrimental to the agricultural or nonagricultural environment of the state:

(a) Any insect, predatory animal, rodent, nematode, or weed.

(b) Any form of terrestrial, aquatic, or aerial plant or animal, virus, fungus, bacteria, or other microorganism (except viruses, fungi, bacteria, or other microorganisms on or in living man or other living animals).

(c) Anything that the director, by regulation, declares to be a pest.”

California Food and Agricultural Code 12754.5

Climate Change and Pests

- Most pests are ectothermic
- Temperature and water
- Changing temperature and water patterns changes pest patterns

Climate Change and Pests

- Time of year
- Number of generations
- Latitude
- Altitude

IPM Principles

- Long-term prevention of pests or their damage by managing the ecosystem
- Monitoring and correct pest identification help you decide whether management is needed
- Combine management approaches for greater effectiveness

IPM Management Decisions

- Evaluate the risks from the pest (=benefits from managing pest)
  - Environmental
  - Human health
  - Economic
- Evaluate the risks from the pest management practice
  - Environmental
  - Human health
  - Economic

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What's New

- Pest Notes: Rabbits, Eucalyptus Redgum Lerp Psyllid revised, Botryosphaeria Canker added
- Home & Garden Pest Newsletter: Summer 2022
- Green Bulletin: Summer 2022
- Ag Pest Management: Citrus, Cole Crops and Floriculture and Ornamental Nurseries revised
- Agriculture: 2022 Fungicides, Bactericides, Biocontrols, and Natural Products for Deciduous Tree Fruit and Nut, Citrus, Strawberry, and Vine Crops in California (PDF)
- Three new videos about the invasive shothole borers' biology, trapping, and management were published
- More...

QUICK LINKS

Newsletters

Recursos en español

Online training

Weather, models,

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Home, Garden, Turf & Landscape Pests

Agricultural Pests

Natural Environment Pests

Exotic & Invasive Pests

HOME

ON THIS SITE

- What is IPM?
- Home & landscape pests
- Agricultural pests
- Natural environment pests
- Exotic & invasive pests
- Weed gallery
- Natural enemies gallery
- Weather, models & degree-days
- Pesticide information
- Research
- Publications
- Events & workshops
- Online training
- Links
- About us

PRINT

Natural environment pests

Insects, diseases, and invasive weeds threaten California's natural environments as well as homes, gardens, and agriculture. This page contains links to articles, fact sheets, and other information prepared by UC scientists on topics related to pests in natural environments.

Insects & other arthropods | Plant diseases | Weeds & other unwanted plants
Aquatic invasives | Vertebrate pests

Insects & other arthropods

- **Asian longhorned beetle**
  - Pest alert (PDF) from Western IPM Center
  - News: Collective effort produces Asian longhorned beetle information
- **Bagrada bug**
  - Bagrada bug
- **Bark beetles**
  - Bark beetles
- **California oakworm**
  - California oakworm
- **Eucalyptus longhorned borers**
  - Eucalyptus longhorned borers

ipm.ucanr.edu/NATURAL/index.html

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Exotic & Invasive Pests

Huanglongbing quarantine in San Bernardino and Los Angeles counties

Invasive & Exotic Pests

Invasive and exotic pests threaten California's natural environments, agricultural production, structures, landscapes and gardens. Learn more about the pests and diseases that are currently in California. Watch/lookout for pests that have a high likelihood of being detected in California in the near future. (👁). What are exotic and invasive pests?

+ Expand all − Collapse all

Insects & Other Arthropods

Asian Citrus Psyllid and Huanglongbing Disease (Citrus Greening Disease)

Ficus Eye-Spot Midge

Ficus Leaf-Rolling Psyllid

Red Bug

Red Imported Fire Ant

https://www2.ipm.ucanr.edu/Invasive-and-Exotic-Pests/Huanglongbing

Pest ID Tools

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- Home, garden, turf, & landscape pests
- Agricultural pests
- Natural environment pests
- Exotic & invasive pests
- Weed gallery
- Natural enemies gallery
- Weather, models, & degree-days
- Pesticide information

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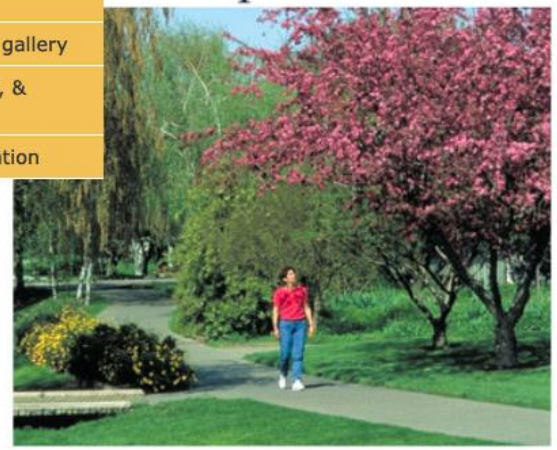


Agricultural Pests

Natural Environment Pests

Exotic & Invasive Pests

Weed photo gallery

The UC IPM Weed Photo Gallery includes many, but not all, weed species commonly found in California farms and landscapes.

Choose a category below or skip to a **LIST OF ALL WEEDS**.

Identify your weeds

Broadleaf
Leaves are wide, veins branch out in different directions.
Identification | **Tutorial** | **Broadleaf list**

Grass
Leaves are narrow, arranged in sets of two; stems are rounded or f
Identification | **Tutorial** | **Grass list**

Sedge
Leaves are narrow, arranged in sets of three; stems are triangular i
Identification | **Tutorial** | **Sedge list**

Aquatic
Plants that grow in water for at least part of their life cycle.
Identification | **Aquatic list**

ipm.ucanr.edu/PMG/weeds_intro.html

How to Manage Pests

Weed Gallery—Broadleaf Gallery

Choose the leaf characteristic or plant form that best matches your weed of interest. To learn more, see broadleaf tutorial.

View by weed name

Plant forms


Spreading plants


Plants that form rosettes


Whorled leaves

Mature leaf characteristics


Roundish (orbicular)


Egg to football (ovate to elliptic)


Heart shaped (chordate)


Narrow or oblong (linear)


Lobed edges


Leaflets (compound)


Deeply divided


Featherlike


Clover or shamrock shaped


Hairy


Prickly, spiny, or bristly


Toothed edges


Succulent (fleshy)


Milky sap


Needlelike or grasslike


Leafless or nubby leaves

ipm.ucanr.edu/PMG/WEEDS/broad_preview.html

Wildlife Pest Identification Tool

Wildlife in California is often appreciated from afar in natural areas. However, sometimes vertebrate animals can become pests in our homes, gardens, schools, parks, and landscapes. If you think you have an animal pest but are not sure what it is, this online tool will help you narrow down potential vertebrate pests using signs such as typical damage, tracks, and droppings (scat). The results will show you information on identification and biology with links to more information including management options.

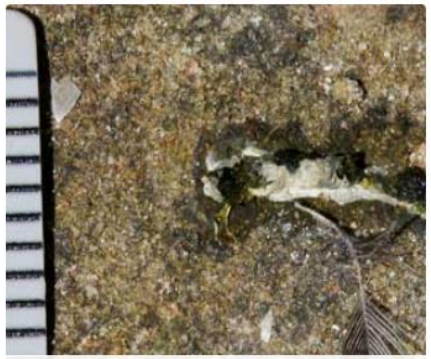
DAMAGE | TRACKS | DROPPINGS

See All Pests | See Selections | Clear All









ipm.ucanr.edu/wildlife-pest-identification

Birds, mammals, and reptiles (Vertebrate pests)

Click on the QT next to a pest name for a brief overview of how to manage a pest.

- Bats
- Birds on Tree Fruits and Vines
- Cliff Swallows
- Coyote
- Deer QT
- Deer Mouse
- Gophers | QT
- Ground Squirrel | QT
- House Mouse QT
- Lizards
- Mice
  - Deer Mouse
  - House
  - Voles (Meadow Mice)
- Moles
- Opossum
- Pocket Gophers | QT
- Rabbits
- Raccoons
- Rattlesnakes
- Rats | QT
- Skunks
- Squirrels
  - Ground QT
  - Tree
- Tree Squirrels
- Voles (Meadow Mice)
- Wild Pigs
- Wild Turkeys
- Woodpeckers

For help in determining what vertebrate pest you have, visit the Wildlife Pest Identification Tool.

ipm.ucanr.edu/PMG/menu.vertebrate.html

Management Tools

Methods for Managing Weeds in Wildlands

Weed Control User Tool (WeedCUT)

This decision support tool provides land managers with guidance on a range of methods for managing invasive plants in wildlands using non-chemical approaches exclusively, for situations when use of herbicides is restricted or not desired. The tool is intended to be developed further to include management practices including herbicides in the future. Explore all management practices below or enter the characteristics of your weed and your site to filter for the most effective practices. A manual containing all listed management techniques is available for free download. Biological control is currently not an outcome for the filtering tool but can be accessed directly through the thumbnail grid below. An Executive Summary provides summary information about using non-chemical methods at a programmatic level.

+ Filter by plant and site characteristics

+ View management practices by select plant species

weedcut.ipm.ucanr.edu

Biological Control

Burning

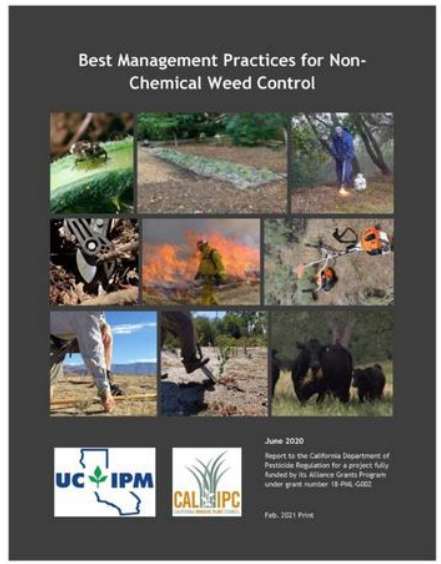
Competitive Planting

Cutting: Bladed Hand Tools

BMPs for Non-Chemical Weed Control

This manual provides comprehensive descriptions of 21 commonly used non-chemical weed control techniques and of biological control agents for 18 weed species/species groups that will help you as a practitioner treat weeds more effectively.

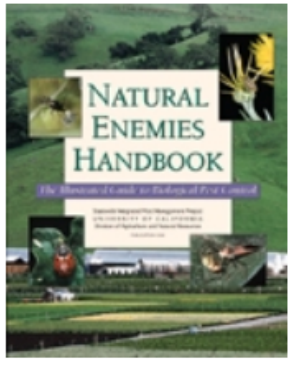
Authors of each chapter have compiled research and on-the-ground knowledge of subject experts on tools and methods of application, as well as on efficacy of techniques under various environmental conditions and across different classes of invasive plants. Environmental, cultural, and human safety risks are also highlighted to help support safe and effective use of techniques. This manual is designed to be a go-to resource for practitioners that are either complementing their weed control work with non-chemical techniques or are exclusively restricted to not using herbicides. Individual BMPs will be incorporated into an online decision support tool still in development.



Best Management Practices for Non-Chemical Weed Control

This manual is available as a free download. Click here for a PDF of BMP for Non-Chemical Weed Control. (291 pp., 21.5 MB)

Natural enemies gallery



Natural enemies are organisms that kill, decrease the reproductive potential of, or otherwise reduce the numbers of another organism. Natural enemies that limit pests are key components of integrated pest management programs. Important natural enemies of insect and mite pests include predators, parasites, and pathogens.

The UC IPM Natural Enemies Gallery includes natural enemy species commonly found on California farms and in landscapes. Additional species will be added over time.

For more information about natural enemies, purchase the Natural Enemies Handbook.

Predators | Parasites | List by order and family name | List by scientific name | List by pest

Additional resources

- Biological Control and Natural Enemies of Invertebrates Pest Note
- Poster: Meet the Beneficials: Natural Enemies of Garden Pests
- Natural Enemy Releases for Biological Control of Crop Pests
- More biological control resources

ipm.ucanr.edu/natural-enemies/

Predators

A predator is an organism that attacks, kills, and feeds on several to many other individuals (its prey) in its lifetime.

Common name	Scientific name
Aphid flies	Chamaemyiidae family
Aphid midge	*Aphidoletes aphidimyza*
Assassin bugs	Reduviidae family
Bigeyed bugs	Geocoridae family

Bee precaution pesticide ratings

Guidance on how to reduce bee poisoning, based on reported pesticide effects on adults and brood of honey bees and other bee species. Ratings are for the pesticide active ingredient, the common name.*

I Do not apply or allow to drift to plants that are flowering including weeds. Do not allow pesticide to contaminate water accessible to bees including puddles.

II Do not apply or allow to drift to plants that are flowering including weeds, except when the application is made between sunset and midnight if allowed by the pesticide label and regulations. Do not allow pesticide to contaminate water accessible to bees including puddles.

III No bee precaution, except when required by the pesticide label or regulations.

Note: These are not the pollinator precautionary statements on the pesticide labels. Some of the listed pesticides are not registered, or approved, for use. Make sure the pesticide use is legal and appropriate before making any application. Always read the label and know and follow the applicable laws and regulations before making any pesticide application. Follow best management practices to protect bees from pesticides.

Frequently asked questions (FAQs) about this tool.

ipm.ucanr.edu/beeprecaution

◉ Common name ○ Trade name → All types → 2,4-D Add to list

✖	Common name (Example trade name)	Type	Mode of action	Rating	Other effects on bees	Toxic to honey bee brood	Toxic to other bee species
Please select a common name or trade name from the list above.							

Symbols legend	
**	Synergism of this premix is based on the reported synergism of one or more of the active ingredients. The "I" to "III" rating of this premix is based on the individual active ingredient(s) posing the greatest hazard to honey bees.
‡	This rating applies only if the pesticide is applied in EPA-approved bait stations that prevent bee exposure. This product is toxic to bees.
	Indicates information available via mouseover or tap.
✖	Remove current row from list.
	Sorted column.
	Column available for sorting.

Conclusions

- Changes in temperature and moisture are changing pest patterns
- UC IPM has tools for -
  - Pest ID
  - Management practice selection
  - Protecting beneficial insects

- Use and share UC IPM information and tools

Questions