



An informed, long-term, sustainable strategy for managing pests.

# Natural Solutions to Pests

## Worm Castings and Worm Tea

The result of worm composting are worm castings and liquid tea, both of which could be employed to combat pests and certain plant diseases. Castings are an effective way to repel white flies, aphids and spider mites and any pest that feeds on plant juices.

Applying castings to the soil around plants increases production of specific enzymes that degrade the exoskeletons of insects. When used properly, castings act as a natural insect repellent. Bad bugs feeding on leaves of those plants will absorb the enzyme, causing its exoskeleton to dissolve and die.

The worm tea can also help fend off pests when sprayed on plants. It contains microbes that multiply quickly and help keep the plants healthy. Similar to us ingesting probiotics. Feeding plants these bacteria-rich nutrients gives them what they need to better fight off pests and diseases. Dilute the liquid tea first as it is very powerful.



To learn worm composting, attend a free workshop. Visit [smartgardening.com](http://smartgardening.com) for a schedule. Beginner workshops teach the basics of backyard composting, worm composting, water-wise gardening, grass cycling, and edible gardening. Advanced workshops teach the basics of organic gardening, drought-tolerant landscaping, and integrated pest management.

## Diatomaceous Earth

Diatomaceous Earth (DE) is a talc-like powder made of fossilized phytoplankton. As an insect treads across it, DE has tiny barbs that compromise the insect's waxy coating, creating wounds and drawing body fluids out to dehydrate and kill the insect.

Moisture, heavy dew, or rain will limit its effectiveness. Be careful not to inhale DE. Also limit application to where pests exist and not where beneficial insects dwell, such as flowers which bees frequent.



## Soil Solarization

Soil solarization harnesses the sun's power to control insects, bacteria and weeds in the soil. This environmentally friendly method involves covering the ground with a transparent tarp to trap solar energy to heat and weaken the offenders.



# Integrated Pest Management (IPM)

## County Program and Assistance

The Countywide IPM Program aims to provide resources and education in supporting residents to successfully manage pests at home with minimum or no adverse impacts to surface water or the environment. IPM benefits:

- It is economically friendly.
- Crops are healthier.
- It is a holistic approach to pest management.
- It reduces economic and human health risks.

The County is ready to help. Contact us or visit these links for advice to identify or control pests:

- **Invertebrates** (insects, snails, etc.)  
County Entomology Lab (562) 622-0431
- **Plant Diseases**  
County Plant Pathology Lab (562) 622-0433
- **Vertebrates** (rodents, birds, etc.)  
County IPM Program (626) 575-5462
- **Plant Diseases:**  
[ipm.ucanr.edu/PMG/menu.disease.html](http://ipm.ucanr.edu/PMG/menu.disease.html)
- **Vertebrate Pests:**  
[ipm.ucanr.edu/PMG/menu.vertebrate.html](http://ipm.ucanr.edu/PMG/menu.vertebrate.html)
- **Natural Environment Pests:**  
[ipm.ucanr.edu/PMG/menu.homegarden.html](http://ipm.ucanr.edu/PMG/menu.homegarden.html)
- **Insect Identification:**  
[insectidentification.org](http://insectidentification.org)
- **General IPM:**  
[ipm.ucanr.edu/WhatIsIPM](http://ipm.ucanr.edu/WhatIsIPM)



@LACountyIPM  
[lacountyipm.org](http://lacountyipm.org)  
[smartgardening.com](http://smartgardening.com)



A guide to a pest free garden!



# What is Integrated Pest Management?

Integrated Pest Management (IPM) is an organic strategy that identifies and changes the underlying factors that contribute to a pest infestation at a damaging level. When the conditions leading to the infestation are modified to the extent that the pest no longer finds what it needs to thrive, the result is long-term, sustainable management of the pest with significantly reduced reliance on pesticides.

In many cases, successful IPM involves combining or "integrating" several strategies into an overall approach. To control pests like plants diseases and damaging bugs, use any combination of these four strategies:

- **Cultural:** Use clean pruning shears. Remove diseased plants. Add beneficial fungi or bacteria.
- **Chemical:** Spray with worm tea, garlic, onion, vegetable oil, or insecticidal soaps.
- **Physical:** Use handpicking. Use barriers such as sticky or copper tape.
- **Biological:** Introduce beneficial insects like ladybugs and praying mantis to feed on the pests.

Learn to change the environment around your home to make it less hospitable to pests and more attractive to natural predators. Help limit or even prevent bug infestations on your property by:

- ◆ **Removing** nesting materials and limiting moisture around building foundations.
- ◆ **Fixing** leaking faucets and other water sources.
- ◆ **Eliminating** food sources such as sugary garbage and insects that excrete a sweet nectar (aphids, etc.) consumed by other bugs.
- ◆ **Avoiding** pesticides unless an actual pest is present and not simply on a routine schedule.



## Should pesticides be used?

Pesticides are a tool for managing pests, but they provide only a short term solution. If conditions leading to pest problems are not changed, the pests may simply return requiring another pesticide application. Pesticides also kill natural predators making resurgence of the original pest likely as well as providing a safer environment for new ones to thrive.

Pesticides enter the environment and potentially contaminate aquifers. Insecticides, such as for spraying ants in the home, have been detected in storm runoff and affect water quality. To protect our health and the environment, try to refrain from pesticide use. If application becomes necessary:

- ⇒ **Use** bait stations instead of spray.
- ⇒ **Avoid** applying on paved or impervious surfaces (driveways, sidewalks, etc.).
- ⇒ **Do not** apply when rain is predicted.
- ⇒ **Ensure** sprinklers aren't washing pesticides off your property and into storm drains.

# Combating Common Plant Diseases



**Mosaic Virus:** Remove affected plants. Control pests such as aphids and leafhoppers, which spread virus.



**Verticillium Wilt:** Rotate crops and avoid planting same crop in same location for five years. Prune affected parts. Practice soil solarization in infected areas.



**Powdery Mildew:** Water the soil, not the plant. Apply copper fungicide.



**Blossom End Rot:** Amend soil with calcium (bone meal, egg shells, gypsum, oyster shells). Water evenly, consistently. Apply mulch. Prune rotted parts of plant.



**Damping Off:** Ensure soil has good drainage, avoid overwatering. Remove and discard diseased plants.



**Fusarium Wilt:** Rotate crops and avoid planting same crop in same location for five years. Prune affected parts of plant. Practice soil solarization in infected areas.

## Snails and Slugs



Control slugs and snails in the garden with natural remedies. Diatomaceous earth can be sprinkled to kill the critters in frequented areas; be careful to use sparingly to avoid killing neutral bugs.

Or sprinkle broken egg shells around your garden (snails and slugs hate the sharp edges). To capture, lay out peels of grapefruit in and around the garden. The peels attract the slugs and snails for removal. Another way to capture is



with beer. Place saucers of beer around affected areas. The beer attracts the critters and they fall into the saucer and drown.

# Fighting Bad Bugs with Beneficial Bugs

## Common Pests



A) Aphids



B) Whiteflies



C) Spider Mites



D) Mealy Bugs



E) Tomato Hornworms



F) Cabbage Worms

## Beneficial Insects



Syrphid Flies > Eats A



Ladybugs > Eats A, B, C, D



Lacewings > Eats A, B, C, D



Praying Mantis > Eats A, B, C, D, E, F



Trichogramma Wasps > Eats E, F



Tachinid Flies > Eats E, F