

# Using IPM to Manage Ground Squirrels

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## Species Identification (Ground Squirrels)

- Gray-brown fur with semi-bushy tail.
- Are social.
- Damage includes girdling of trees, consumption of forbs and grasses, chewing of irrigation lines, and abundant burrow openings.



## Species Identification (Ground Squirrels)

- Squirrels are active throughout the day and are frequently visible.
- They prefer to burrow next to buildings, on field edges, and alongside fencerows and roadsides.



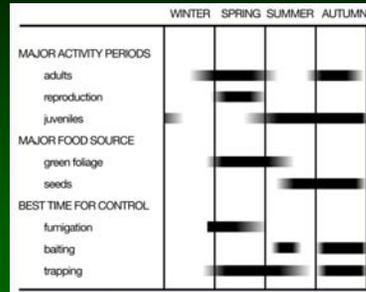
## Current Control Strategies

- Currently, we focus on an integrated approach that utilizes a number of strategies and tools to control vertebrate pests.



## Importance of Biology/Ecology

- Understanding the biology and ecology of vertebrate pests will guide management decisions.
- Example:
  - California ground squirrel



## What Control Options are Available?

	Habitat modification	Baiting	Burrow fumigation	Trapping	Exclusion	Repellent	Frightening	Shooting
Ground squirrel	X	X	X	X				X

## Control Options—Biocontrol

- Natural predators have been used to control vertebrate pests.
- Owl boxes are not appropriate for ground squirrels.
- Raptor perches appear ineffective.



## Control Options—Habitat Modification

- Involves altering habitat to reduce the desirability for pests.
- Example:
  - remove brush piles to control ground squirrels



## Control Options—Habitat Modification

- Involves altering habitat to reduce the desirability for pests.
- Example:
  - remove brush piles to control ground squirrels
  - destroy old burrows



## Control Options—Trapping

- Control of small populations of California ground squirrels is possible with traps.
- Trapping for ground squirrels is effective year round except during middle of summer and can be a good follow up to alternative control methods.

	WINTER	SPRING	SUMMER	AUTUMN
<b>MAJOR ACTIVITY PERIODS</b>				
adults		■	■	■
reproduction		■	■	■
juveniles	■	■	■	■
<b>MAJOR FOOD SOURCE</b>				
green foliage		■	■	■
seeds		■	■	■
<b>BEST TIME FOR CONTROL</b>				
fumigation		■	■	■
baiting		■	■	■
trapping	■	■	■	■

## Control Options—Trapping

- Body-gripping traps, tube traps, and box-type squeeze traps are common kill traps.
- Wire cage traps are common live traps.
- Live traps require euthanizing target animals.



## Control Options—Baiting

- Involves use of poison baits to control vertebrate pests.
- There are restricted use and non-restricted use baits but typically most are now restricted use unless using in your yard or garden.

	Anticoagulants	Zinc phosphide	Strychnine
Ground squirrels	X	X	

## Control Options—Baiting

### Anticoagulants

- used for spot treatments, broadcast, or in bait stations
- require multiple feedings



## Control Options—Baiting

### Zinc phosphide

- is an acute toxin.
- potential bait shyness.
- can be used for spot treatments and broadcast baiting.
- not to be used in or around buildings.



## Control Options—Fumigation

- Involves use of poison gas in burrows.
- Works best when soil moisture is high (after ground squirrels emerge in winter/spring).
- Fumigants should not be used around buildings.



## Control Options—Fumigation

### Gas cartridges

- Effective for California ground squirrels (62–86% control).
- Caution must be used to prevent fires.

### Aluminum phosphide

- Highly effective for ground squirrels (97–100%).
- Is a restricted use pesticide.



## Control Options—Fumigation

Carbon monoxide producing machines



## Control Options—Fumigation

- Steve Orloff and I have already begun to collect efficacy data.
- PERC appears to be moderately effective, while the Cheetah was ineffective.

Species	Device	Authors	# of fields	Efficacy
Belding's GS	PERC	Orloff	2	76%
California GS	PERC	Baldwin	2	66%
California GS	PERC	Baldwin	2	100%
California GS	Cheetah	Baldwin	3	-7%

## Control Options—Shooting

- Shooting can be effective for controlling ground squirrels although it is labor intensive.
- Increasing restrictions on use of lead bullets.



## Control Options—Other Strategies

### Gas Explosive Device

- Involves combustion of propane and oxygen.
- Kills animal through concussive force and will destroy burrow system.
- May not be overly effective and has potential hazards.



# Got Wild Pigs???

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### Feedback

**GOT WILD PIG DAMAGE???**

UC Cooperative Extension Advisors and Specialists have created a service to collect information about wild pig damage. If you experience wild pig damage on your property, please consider taking the time to complete the following survey: <http://www.ucscc.edu/extension/ucce/extension/2012>

Additional details about the survey can be found at the link provided. Your responses will help guide future efforts at managing the damaging species.

We have created a mobile app that can be used to monitor the extent of damage caused by wild pigs. If you are interested in more information about the mobile app, please [click here](#).



Photo Courtesy of Figure Ranch Conservancy

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