



COUNTY OF SAN LUIS OBISPO

Department of Agriculture/Weights and Measures

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GROUND SQUIRREL MANAGEMENT

WHY CONTROL GROUND SQUIRRELS: Ground squirrels inhabit most agricultural and rural areas of California. Ground squirrels damage a wide variety of crops; including grain, fruits, nuts, and vegetable crops at the seedling stage. Young orchards can be damaged by gnawing of the bark. The ground squirrel's extensive burrowing can damage root systems as well as cause serious erosion problems.

Bubonic plague cases have been detected in the wild. The most common method of transmission involves the ground squirrel; they act as host to plague-infected fleas. Never handle a dead or sick rodent. Extensive rodent die-offs (other than planned) should be reported to local health authorities.

FIRST FEW STEPS: The first step is to go out and survey the extent of your problem.

1) Have you correctly identified ground squirrels as the pest causing the problem? Don't confuse ground squirrels with gray tree squirrels, which are classified as game mammals by California Department of Fish and Game. California ground squirrels are about the same size as tree squirrels (1-1/4 to 2 pounds). The ground squirrel's base color is brown with gray flecked back and sides. Cheek pouches are membranous.

2) Survey the habitat. Ground squirrels live in underground burrows. The burrows are used for safety, shelter, and the rearing of young. Burrow openings average four inches wide, with above-ground interconnecting runways. Ground squirrels are normally found in colonies located on flat lands, hillsides, among rocks, embankments, and fence lines.

3) What kind of damage is occurring or expected? To prevent crop losses, control must be undertaken well in advance of any initial damage.

4) Evaluate environmentally sensitive areas at the control zone. Take the time to survey for wildlife or domestic animals that could be affected by the proposed treatment. Take precautionary measures by buffering sensitive areas or telling nearby neighbors what you are doing.

5) Do your neighbors have ground squirrels which will re-invade your property? Talk to your neighbors about having a program that would coincide with yours.

SO YOU'VE DECIDED YOU NEED A CONTROL PROGRAM: Responsible management uses the most effective combination of tools for a given situation. The following are available options:

HABITAT MANIPULATION: Develop an understanding about the surrounding habitat. Consider the presence of beneficial wildlife and their habitat needs, as well as the pest species. Altering the habitat can make an area less favorable for ground squirrels. Junk piles, pruning stacks, rock piles, and old equipment act as harborage; and should be removed.

Recent studies indicate that destroying the burrow systems after a control program detracts squirrel re-invasion of the area. Shallow roto-tilling is ineffective. The tractor should be equipped with a rippage blade 18 inches in depth.

Ground squirrels prefer to build burrow systems in areas with little vegetative cover. Thus, overgrazing will further the growth and establishment of ground squirrels in rangeland areas. An increase in the vegetative cover may not be entirely successful in the permanent reduction of established ground squirrel colonies. Cover may not be the only limiting factor as long as there is a food source nearby.

PREDATORS: Many natural predators, such as coyotes, foxes, bobcats, badgers, hawks, eagles, rattlesnakes, and gopher snakes, eat ground squirrels. Predators are beneficial in reducing ground squirrel numbers and preventing them from invading marginal habitats. Unwarranted reduction of predators should be avoided. The use of artificial perches and nests may be used to enhance raptor use of an area.

TRAPPING: Trapping can be successful in controlling ground squirrels in smaller areas or as a follow-up program. Live catch traps and a box-type squirrel trap are most effective when placed on the ground near burrows or runways. The traps can be baited with nuts, grains, uncooked oatmeal/peanut butter blend, or melon rinds. A conibear trap can be set directly over the burrow opening. Do not set conibear traps where children, pets, or non-target animals may get caught.

SHOOTING: Persistence is required. Shooting may be practical for small populations or can be used in conjunction with other control methods. Keep in mind that appropriate authorities should be contacted about the lawful/unlawful discharge of firearms within the county.

FUMIGANTS: Fumigants offer certain advantages because they are selective and fast-acting. Fumigants should be used when the soil is moist and tight, otherwise the gas will escape and be ineffective. Fumigants should not be used adjacent to structures.

The two types available are gas cartridges and aluminum phosphide tablets/pellets. The gas cartridge is a mixture of chemicals, and when ignited gives off suffocating gas. Gas cartridges should not be used where a fire hazard exists, as smoke coming from the cartridge occasionally ignites. Aluminum phosphide tablets/pellets generate a highly poisonous and flammable gas under the influence of moisture. Placing a wad of crumpled newspaper into the burrow after the tablets will prevent soil from covering the tablets. Retreatment of burrows that squirrels have dug out is necessary when using fumigants. Check all treated burrows after 72 hours and treat

all re-opened burrows.

POISON BAITS: Anticoagulant baits are commonly used for ground squirrel control. Anticoagulants are multiple-dose rodenticides that require several feedings on 5 or more successive days, with no periods longer than 48 hours between feedings. Anticoagulants have two actions; they reduce the clotting ability of the blood and cause damage to the capillaries (tiny blood vessels).

WARNING: Anticoagulants have the same effect on nearly all mammals and many birds. They are a helpful tool when used selectively; however, care should be taken to prevent non-target poisoning. Do not allow non-target species, including dogs and cats, to feed on bait or consume poisoned rodents (bait may remain in gut contents). Keep unauthorized persons and children out of treatment areas and storage sites. Seek medical or veterinary services if you suspect non-target poisoning has occurred. An antidote for anticoagulants is Vitamin K.

A .005% concentration of diphacinone or chlorophacinone is registered for use in bait stations. Covered bait stations containing one to five pounds of bait are placed in areas frequented by ground squirrels (near runways, burrows, etc.), about 100 to 200 feet apart. Bait must be kept in bait stations until all feeding ceases, which may be one to four weeks. Initial acceptance of the bait may not occur until the squirrels become accustomed to the bait station, which may be several days. Bait stations should be secured so they cannot be turned over. There are different types of bait stations that can be used.

A .01% concentration of diphacinone or chlorophacinone is registered for ground squirrel control, using a repeated spot treatment method (three to four applications every other day). The bait is scattered above ground near active burrows. Do not place bait in piles, as this may attract non-target species. Do not place handfuls of bait down burrow holes. Scattering the bait above ground takes advantage of the ground squirrel's natural above ground foraging tendencies. Each bait treatment should be placed in the same area as previous baiting to allow multiple feedings to occur.

WHEN TO CONTROL: It is much easier, less expensive, and less time consuming to control a population before there is extensive damage. Many control methods are effective against ground squirrels only at certain times of the year. Ground squirrels have a specific life-cycle, and knowledge of this is important when initiating control measures. The exact dates of changes within the life cycle will depend on the region, year, weather conditions, etc.

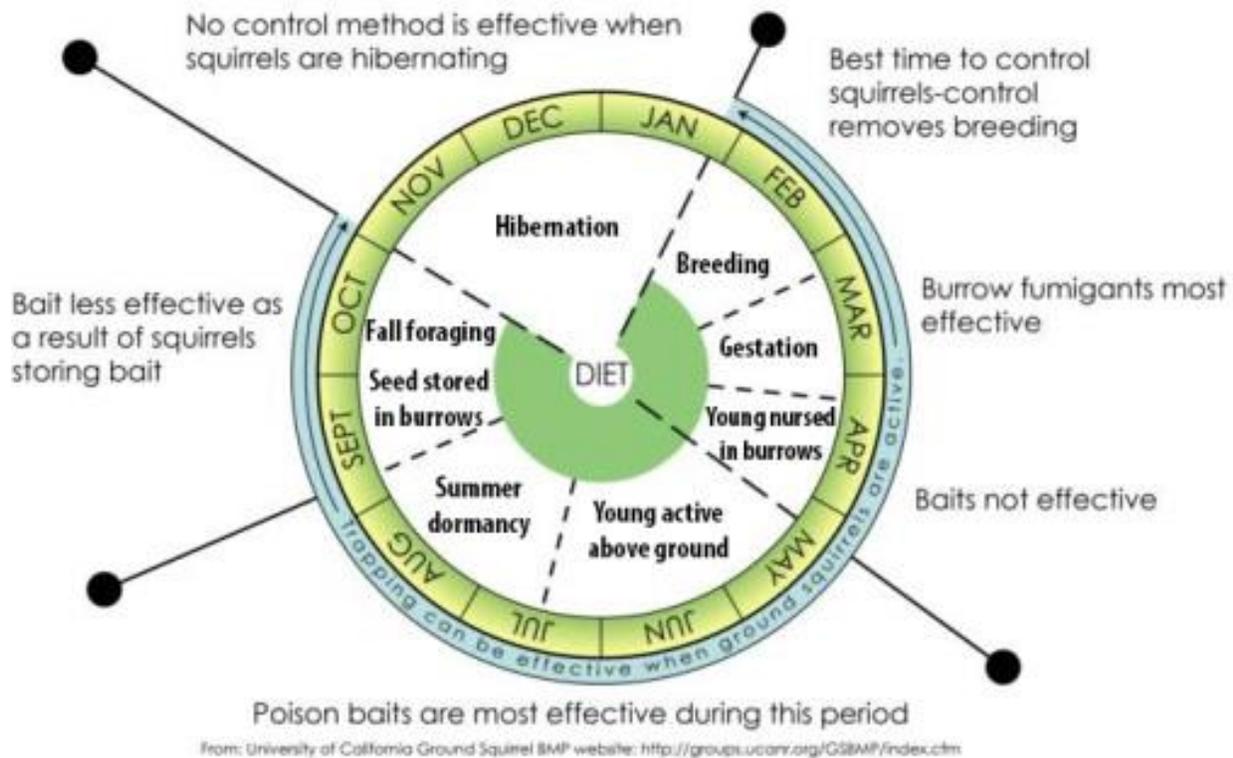
In colder regions, ground squirrels hibernate during the winter. Although some squirrels without a fat reserve may remain above ground, this is generally not the best time to initiate control. If you use fumigants, the animals hibernating probably won't inhale a fatal dose (respiration extremely slow/nest may be plugged off). Also, those squirrels remaining above ground feed chiefly on green herbage, and grain or pelletized baits may not be eaten.

Ground squirrels emerge during late winter, early spring and this is when breeding takes place. Fumigants can be effectively used after the ground squirrels have emerged from winter hibernation and before that year's young are born. The ground is usually moist from normal rainfall, making it an excellent time for using fumigants. The ground squirrel's normal diet is still chiefly green herbage, and grain or pelletized baits may remain uneaten.

After a gestation period of 25 – 30 days, a litter is produced averaging 7 – 8 young. The females spend a lot of time below ground while nursing their young, and may not regularly feed above ground if you are using a bait program. The young remain underground until approximately six weeks, at which time they come out and feed with the adults. During late spring/early summer the ground squirrel's diet normally switches from green herbage to seeds and nuts. A bait program is most effective when the diet has shifted to primarily a seed diet and all ground squirrels are active above ground.

Ground squirrels are active until the hotter summer months, when there is a period of inactivity known as estivation. The young of the year, as well as ground squirrels along coastal areas, probably won't estivate. A control program will not be effective if some of the squirrels are estivating, so initiate control either prior to or after estivation. Ground squirrels will emerge as the summer-early fall temperatures cool. Later, adverse environmental conditions will decrease activity during fall and induce winter hibernation.

California Ground Squirrel - Calendar of Management



MONITORING GUIDELINES: Ground squirrel control is usually NOT a one-time procedure. CONTINUE TO MONITOR THE SITE FOR RE-INFESTATION. Since ground squirrels are fair-weather, day-feeding rodents, observe the site during daylight hours when the ground squirrels would be most active.

GENERAL GUIDELINES FOR RODENTICIDES: Purchasers and users of gas cartridges and anticoagulant baits must obtain an Operator Identification Number (OIN) from the Agricultural Commissioner's Office. The anticoagulant baits are Federally Restricted and also require a Private Applicator Certificate (PAC). Aluminum phosphide is a restricted material and requires a PAC

and a Restricted Materials Permit. PACs require an examination. Permits and PACs are issued by appointment only. See the office locations listed below.

As with all pesticides, read and follow all directions on the rodenticide label. It is unlawful to use a pesticide in conflict with labeling. Unlawful use is subject to enforcement action, such as Notices of Violation and/or fines.

ENDANGERED SPECIES CONSIDERATIONS: Several endangered species are located within San Luis Obispo County. It is the user's responsibility to carefully read the rodenticide label and follow the directions for use within endangered species areas. Refer to the department's handout on Endangered Species Considerations for additional information.

ADDITIONAL INFORMATION ON GROUND SQUIRREL CONTROL: The following websites have additional information on ground squirrel control.

- www.ipm.ucdavis.edu
- http://ucanr.org/sites/Ground_Squirrel_BMP/

OFFICE LOCATIONS

810 W. Branch
Arroyo Grande, CA 93420
(805) 473-7090
8:00 am – 2:30 pm

2156 Sierra Way, Ste A
San Luis Obispo, CA 93401
(805) 781-5910
8:00 am – 5:00 pm
Closed 12:00 pm – 1:00 pm

350 N. Main St., Ste A
Templeton, CA 93465
(805) 434-5950
7:30 am – 2:00 pm

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