

Vertebrate Pest Management in Pistachio
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California ground squirrels, pocket gophers, meadow voles and jackrabbits may be significant pests in pistachio orchards. They cause damage by feeding on nuts, tree roots and bark, and can stunt tree growth or even kill young trees. Burrows and mounds created by ground squirrels and pocket gophers interfere with orchard maintenance and harvesting operations. In addition, rodents, coyotes and rabbits can damage drip/micro-sprinkler irrigation lines.

The rodent and rabbit pest problems in a given orchard are determined in large part by the orchard's location. Problems are often worse in orchards that are adjacent to rangeland, waterways or unmanaged areas where pest populations are not controlled. Orchard management activities also have some effect; for example, flood irrigation and orchard floor cultivation may discourage meadow mouse populations.

The most successful approach to dealing with rodent and rabbit problems is one that aims to manage their populations at levels where significant damage never occurs. This preventative approach is of particular importance in organic orchards where the options for reducing high density damaging populations are limited to labor intensive techniques such as shooting or trapping.

Management programs for rodent and rabbit pests involve 4 basic steps:

- Correctly identify the species causing the problem. Signs such as tracks, feces, plant damage and burrows may be used to identify which species is responsible for damage.
- Alter the habitat where feasible to make the area less favorable to the pest species
- Take early action and use the control methods appropriate for the orchard and time of year, with due consideration for the environment and non-target (especially endangered) species
- Establish a monitoring system to detect re-infestation so that you can determine when additional corrective measures or controls are necessary

Regular monitoring of rodent and rabbit pests in and around orchards should form the basis of a management program. Historical records of pest population levels, control measures implemented, and the effect of the method, can be used to help determine the best management approach. For most pests, more than one control method is usually available, although their relative effectiveness may vary.

Vertebrate control equipment and supplies (baits, fumigants etc) are available at local retail outlets such as farm supply and hardware stores. In addition, many Agricultural Commissioners sell some control materials. For further information on sources of control materials, consult your local University of California (UC) Farm Advisor or Agricultural Commissioner.

Only pesticides that are registered with EPA's Department of Pesticide Regulation (DPR) can legally be used for vertebrate pest control. Registered materials are listed in DPR's database that is available online at <http://www.cdpr.ca.gov/>. You may also contact your Agricultural Commissioner for information on registered materials. In areas where endangered species are present, there may be restrictions on some vertebrate pest control measures. Use restrictions in endangered species habitats are outlined in County Bulletins that are available through DPR's web site or from your Agricultural Commissioner.

Bird management in orchards can be challenging, as bird populations are very mobile, migratory birds are federally protected, few or no poison baits are available, and they are adaptable to existing control measures. The four-point management program for vertebrate pests as outlined on page one of this chapter especially applies to bird control. Pistachios are a more recent crop to the San Joaquin Valley and if acreage increases, so will the bird population that feeds on the crop.

It will be critical to correctly identify the specific bird attacking an orchard so as to determine the best control methods. Two of the most common bird species that attack nut crops in the Valley are crows and blue jays. Other bird species may be attracted to pistachios also. With any bird species, it is critical to identify the type of bird, and thus its legal status and if a depredation permit is required. No permit or depredation order is required (CDFG Code section 3801) for English house sparrows, and Starlings (except if it is trapped). No permit is required for crow, magpie, grackle, and a few other blackbirds (except if they are trapped) as these birds are covered by a general depredation order. A depredation permit is required from US Fish and Wildlife Service for all birds covered under the Migratory Bird Treaty Act. The Agricultural Commissioner's office can issue a Migratory Bird Permit for the following birds: horned lark, house finch, golden and white crowned sparrow, and when trapping any bird. When in doubt, contact the Agricultural Commissioner's office for assistance.

There are several resources, both printed and on the World Wide Web, available on vertebrate pest management.

2005. **Pistachio Production Manual**, 4th edition. Vertebrate Pest Management, pp. 233-241. (Book and CD can be ordered at <http://fruitsandnuts.ucdavis.edu/crops/pistachio.shtml#tools>)

<http://groups.ucanr.org/gsbmp> ground squirrel management

<http://vpconference.org/other.html> information and links on several vertebrate pests

<http://www.cdpr.ca.gov/docs/es/index/htm> rodent control inside Endangered Species areas

<http://wfc.ucdavis.edu/www/Faculty/Desley/programs.htm> rodent control

<http://www.ipm.ucdavis.edu/PMG/PESTNOTES> rodent control