Management of Gophers in an Agricultural or Landscape setting: An Informational Handout

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Vertebrate Pest Species Identification

Pocket gophers (*Thomomys* spp.)

- Burrowing rodent 6–8 inches in length.
- Feed on taproots thereby killing plants.
- Burrows result in loss of irrigation water.

Moles (*Scapanus* spp.)

- Burrowing mammal with pointed snout and broad feet.
- Feed on worms and insects.
- Burrows can result in loss of irrigation water.

Voles (*Microtus* spp.)

- Have dark grayish brown fur and are 4–6 inches in length.
- Populations tend to cycle, exhibiting eruptive growth patterns.
- Will girdle stems and roots and consume herbaceous plants.

Burrow/Mound Identification

Pocket gophers

- Mounds are plugged and fan-shaped.
- Plug located at lower end of one side.

Moles

- Mounds are volcano shaped.
- Plug located in middle of mound or not visible.

Voles

- Have shallow burrows (2 in. across) with well-worn trails leaving burrows.
- Burrows not plugged.

Other Identification Tools

Pocket gophers

- Create feeder holes that may be plugged or open.

Moles

- Can be identified from raised earth indicating underground tunnels.

Voles

- Can look for fecal pellets and clipped vegetation along tunnels.

Pocket Gopher Control Methods in Field Setting

Habitat modification

- Involves altering habitat to reduce desirability for vertebrate pests.
- Example includes removing preferred foods (i.e., clover, nutsedge) of gophers.

Biocontrol

- Relies on natural predators (e.g., owls, hawks, snakes) to control gophers.
- Not very effective.

Repellents and frightening devices

- Relies on methods to deter gophers from causing damage.
- Examples: chemical repellents and sonic stakes; does not appear to work.

Baiting

- Poison baits fall into two categories: anticoagulants and acute toxins.
- Anticoagulants (e.g., diphacinone, chlorophacinone) usually require multiple feedings.
- Acute toxins (e.g., zinc phosphide, strychnine) often are restricted-use materials.
- Can be effective for pocket gophers.
- Read labels for application instruction.
- Burrow builder can also be used to treat large areas for gophers. However, be sure gopher activity is high when using, as artificial burrows create gopher highways.

Fumigation

- Involves use of poison gas in burrow to control gophers.
- Examples include aluminum phosphide (restricted-use material) and gas cartridges.
- Gas cartridges not overly effective for pocket gophers.
- Aluminum phosphide very effective for pocket gophers.
- Use of carbon monoxide (vehicular exhaust) is not legal for use in California.

Gas explosive device

- Involves combustion of propane and oxygen in burrow system to dispatch gophers through concussive force; also destroys burrow system.
- May not be overly effective.
- Has potential hazards including injury to user, destruction of underground pipes, and causing fires. Also very loud, so not appropriate in residential areas.

Trapping

- Involves lethal control through physical capture.
- Many kinds of traps available with varying degrees of effectiveness.
- Has many positive qualities including knowledge that you killed the target animal, no use of toxic chemicals, available for use in organic setting, and can be efficient and economical once user becomes proficient at trapping.

Gopher Trapping Protocol

Step 1: Locate freshest mounding activity. Key is to look for mounds that contain moist dirt. If you are unsure how to detect fresh mounds, you can knock down old mounds 1–2 days before trapping. Then all new mounds should be fresh and active. If following rain or irrigation, it is best to wait 1–2 days before trapping. Gophers are relatively inactive immediately following watering events. However 1–2 days after these watering events, gophers are typically very active and fresh mounds are easy to discern.

Step 2: Use probe to find gopher tunnels (Fig. 1). Start by finding the plug of the mound and then start probing anywhere from 4–12 inches behind this plug. You will know you have found the tunnel when you feel a drop in the probe (i.e., less resistance) of a couple of inches. Tunnels are usually 6–12 inches below the surface, though they will occasionally be deeper. Finding tunnels takes patience and skill. Practice will eventually yield much quicker tunnel detection.

Step 3: Dig down to tunnel. Clear out tunnel until opening is just big enough to insert trap.

Step 4: Set traps and place into tunnels (Fig. 2). Push traps back until the entire trap is within the tunnel. Stake traps down so the gopher does not run off with the trap. These stakes can also serve as markers to indicate where you set the trap.

Step 5 (optional): Cover trap-hole up with sod, plywood, canvas, or some other material to keep light from entering tunnel system.

Step 6: Check traps 24–48 hours later. If no activity, move to new tunnel system.

Figure 1. Probing for gopher tunnel.

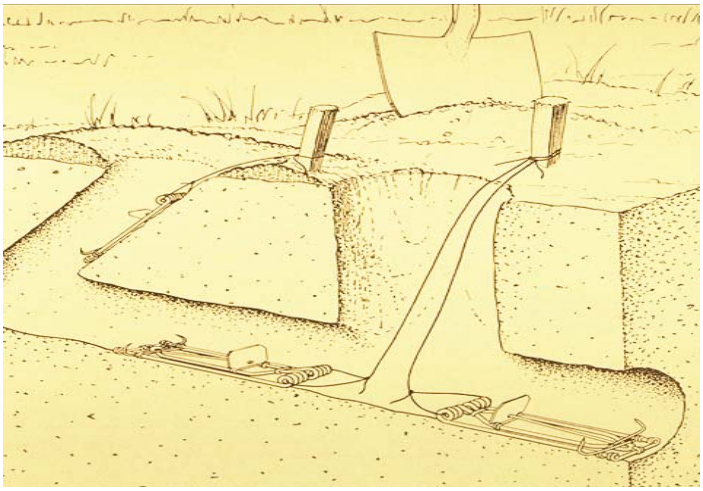

Figure 2. Illustration of gopher trap-sets.

Gopher Trapping Study

Overview:

The goal is to assess the effectiveness of two different traps (Gophinator and Macabee) at capturing gophers, as well as testing the effectiveness of leaving trap-sets covered and uncovered. We are also looking at how the weight and gender of the individual gopher influences this relationship. During the late spring-early summer seasons, we trapped at 2 sites in northern California, 4 sites in the Central Valley, and 1 site in southern California. We just finished trapping additional sites in the fall season to determine potential seasonal differences.

Current findings:

During the late spring-early summer season, we captured 269 gophers: 156 in Gophinator traps, 113 in Macabee traps. The disparity in capture rates was driven by the size of gophers (Fig. 3). Once gophers reached weights > 100 grams, the Gophinator trap became more effective than the Macabee. Below these weights, capture success was equivalent for these traps.

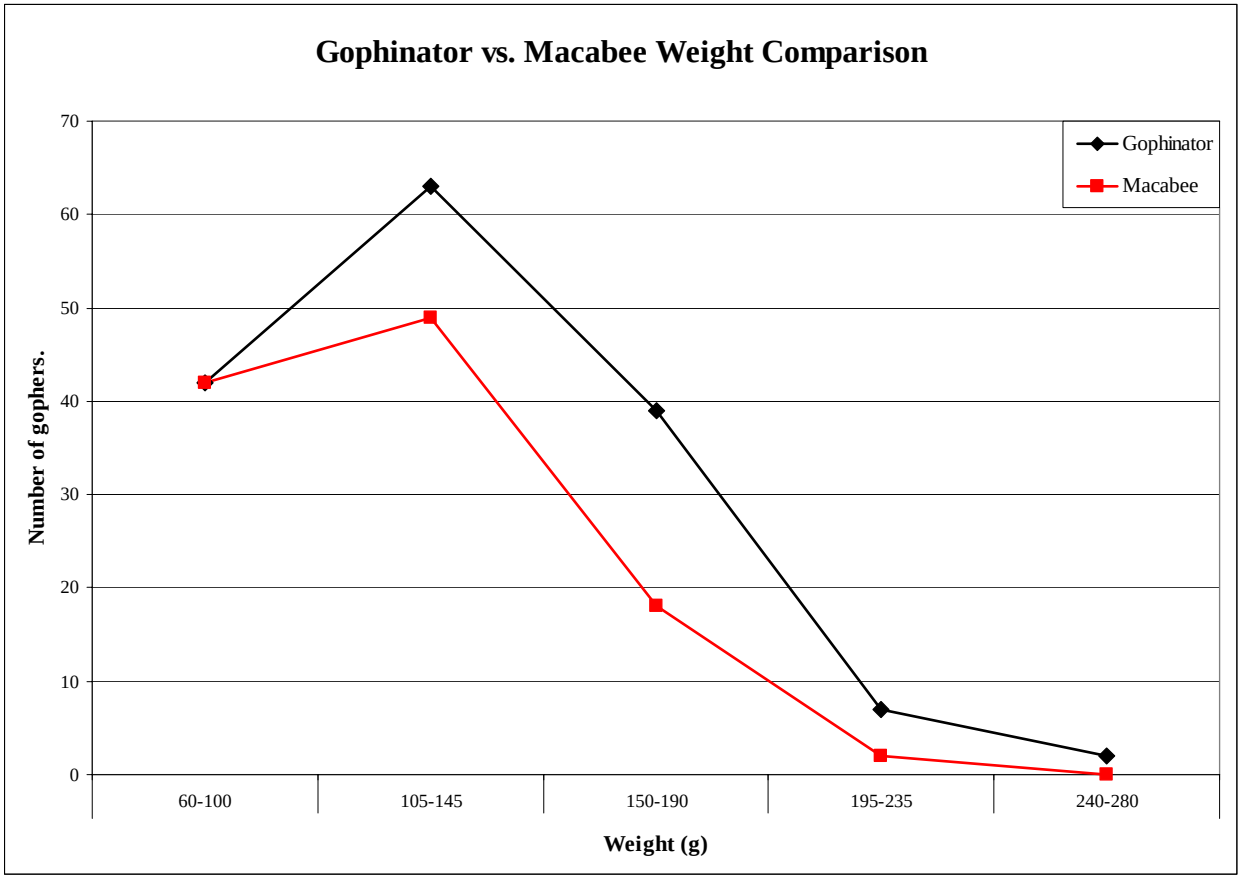

Figure 3. Graph exhibiting the number of gophers captured compared to weight classes (in grams) of gophers for both Gophinator and Macabee traps.

Results comparing covered vs. uncovered sites did not appear to differ. We captured 141 gophers in covered trap-sets, and 128 gophers in uncovered trap-sets. This indicated no statistical difference in capture success between the two methods. Capture success from covered and uncovered sites was also not influenced by weight of the individual gopher. Therefore, given that it takes longer to cover trap-sets, we would suggest that covering trap-sets is not necessary. However, if trappers prefer to cover, this should be equally effective.

Gender ratios were 52% male:48% female and had little influence on capture success due to either trap type or whether or not the trap-set was covered or uncovered. We have just completed the fall trapping season. Once we complete analysis of this data, we should have a better understanding of how season influences capture success of gophers, as well.

INFORMATIONAL WEBSITES

Much information is currently available to assist with wildlife pest problems. I've listed a number of websites below that may be of use when dealing with such situations.

R. Baldwin website.—Contains all the links below, plus a few additional resources. http://www.uckac.edu/uckac/people/faculty%20descriptions/baldwin.html

UC IPM Pest Notes.—Valuable resource for information pertaining to many wildlife pest issues for California. http://www.ipm.ucdavis.edu/PMG/menu.vertebrate.html

UCCE Vertebrate Pest Control Education Videos.—Superb resource for all aspects related to California ground squirrels, pocket gophers, and meadow voles. http://groups.ucanr.org/vpctraining/

California Department of Pesticide Regulation Endangered Species Query.—Allows the applicator or landowner to determine if any endangered species are found at a location where pesticides are to be used. Simply add information to query to determine if any endangered species are present and need to be considered before applying the pesticide of interest. http://calpip.cdpr.ca.gov/county.cfm

The Vertebrate Pest Control Handbook.—Contains extensive information on many subjects pertaining to wildlife pests in California including information on general biology of California birds and mammals, laws and regulations, the role of wildlife in spreading disease, and information on the use of toxicants and fumigants for controlling wildlife pests in California. http://www.vpcrac.org/about/handbook.php

Internet Center for Wildlife Damage and Management.—Contains extensive information on wildlife pest control, although it is designed for the entire U.S., not just California. Therefore, other websites may provide more specific information for California. Nonetheless, it is a valuable resource. http://icwdm.org/

Extension.—Similar to the ICWDM website listed above. Excellent resource, but provides information for all of the U.S. http://www.extension.org/