

APPLICATORS NEWS

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Promoting the efficient and proper use of pesticides through continuing education of all applicators

MANAGEMENT OF GOPHERS

Vertebrate pests live in and around vineyard and orchard settings and can cause significant damage. Damage will depend on the location, surrounding habitat, and population size of the vertebrate pest in question. Gophers, ground squirrels, meadow voles, and rabbits are the primary vertebrate pests living in perennial crop systems and will cause long-term damage if left unchecked. Gnawing on tree and vine roots and trunks will lead to large areas of dead plants. These pests can also damage irrigation systems and cause erosion by diverting water via their burrows. Although these pests have natural predators, growers should not rely on them solely for controlling large populations of vertebrates. This past winter, we held a field day that focused on gopher management in vineyard settings. Following are some of the strategies that were discussed at the field day.

Gopher Habitat: Visual identification of gophers may prove difficult since they rarely venture outside of their burrows. Living underground, gopher activity includes the building of an intricate burrow system that can only be detected by the distinct mounds found at each opening. Openings to the burrow matrix may be plugged or open, but recent activity can be identified by the moist, friable soil that gophers push out of recently made burrows. Growers should focus their management efforts on these types of mounds and not the ones that are dry.

Injury: Although they feed mostly on root systems of herbaceous plants, gophers will sometimes pull entire plants below ground or nibble on above ground plant parts near their tunnel entry. Grapevines are damaged when gophers gnaw on roots or bark below the soil line. Vines damaged by this type of feeding will look water stressed or will die as a result of girdling, a process that removes the cambium and does not allow for natural repair. Vineyards older than ten years of age display little damage from gophers, perhaps due to the larger root system characterized by the corky periderm protecting the inner bark layer and cambium.

Traps: Traps, when set correctly, work well against gophers but are time consuming due to preparation and monitoring. Traps are most effective when populations are low and when they can be checked in a reasonable amount of time. Several types are available, but the two-pronged pincher types are the most popular (Fig. 1). When populations are high, trappers will need to focus their efforts in locations with high activity, setting many traps multiple times throughout the season.

Setting Traps:

- Locate main burrow using a probe (long screwdrivers work well) and open a section with a gardening shovel large enough so traps can be placed within the burrow.
- Place traps in pairs facing opposite directions (Fig. 2).
- Secure traps with a wire flag for monitoring and retrieval.
- Openings can be left open or covered. If you plan on covering the opening, use cut pieces of a dark fabric (or other material, e.g. plywood) to exclude light. Place soil around the edges of

Figure 1

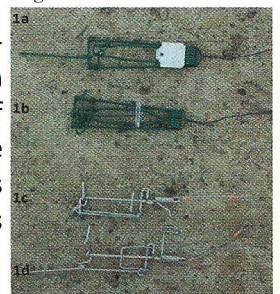
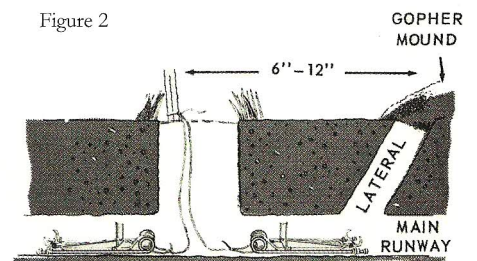


Figure 2



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(Continued from page 1)

the fabric covering hole to help exclude excess light and encourage the gopher to continue using the tunnel. However, we found equivalent capture probabilities with uncovered sites; these uncovered sites are quicker and easier to set and check. As such, it may be preferable to leave openings uncovered.

- Monitor traps daily, moving and resetting in a new location if necessary.
- If large populations exist, traps may prove difficult to maintain. Other management strategies should be explored.

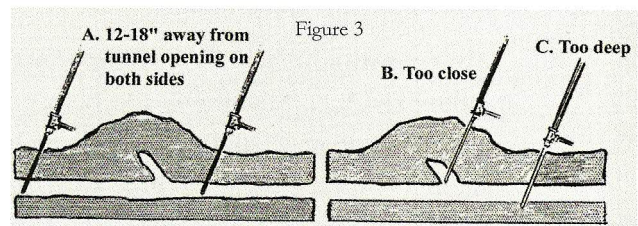
Baiting*: Toxic baits are available for controlling gophers and provide a potential alternative for larger populations. Three different types are available to growers: Strychnine, zinc phosphide, and anticoagulants (diphacinone and chlorophacinone). Baits can be applied by using hand applicators or by a tractor driven mechanical applicator that makes an artificial tunnel. Use of these baits may be restricted depending on how and where they are applied. Be sure to check the label before application to ensure proper application.

Hand Applications:

- Using a gopher probe/applicator (Fig. 3), locate burrow near a fresh mound. It is important that bait be placed 12-18" away from burrow entrance on both sides of the opening. Bait placed too close to the opening or too deep may not be used by gophers.
- Enlarge the hole by moving the probe in a circular motion so bait can be strategically placed.
- Cover the opening with sod or a rock to exclude light. Place soil around the sod or rock covering the hole to exclude excess light and encourage the gopher to continue using the tunnel.
- Place bait in two to three locations within burrow.
- Monitor activity and reapply as needed.

Mechanical Applications (Burrow Builder):

- Determine soil moisture. Soil should contain enough moisture so the artificial burrow will not collapse (too dry) or tractor does not get stuck (too wet). Late winter or early spring is the best time to use burrow builders (Fig. 4).
- Artificial burrows should be made down row centers between vine rows. The perimeter of the infested area should also be baited.
- Check to make sure burrows are being properly made and baited.
- Limit vineyard equipment usage for several days after application to maintain the integrity of the artificial burrow. This will allow gophers to find the burrows and consume bait.
- Monitor activity and reapply as needed.
- **NOTE:** Burrow builders should only be used if populations are high. Making single tunnels the length of the vine row may encourage and increase gopher activity.



Fumigants*: Not all fumigants are effective against gophers due to their ability to detect and seal off tunnels quickly. However, aluminum phosphide¹ can be a very effective fumigant for controlling gophers; it works best during the late winter or early spring months when the soil is moist, as soil moisture helps retain the gas within the burrow. Burrows should be located using a probe and tablets dropped into the hole and sealed. Be careful not to bury tablets with loose soil; otherwise, the phosphine gas will not evolve properly. Activity should be monitored to determine effectiveness of fumigant. Follow up with additional treatments if new activity is noticed. Fumigants should not be used in gopher burrows near or around buildings due to potential escape of the fumigant. ¹ **Restricted use material and requires a permit for purchase and use.**

Gas explosive device*: A device that combines propane and oxygen in a given mixture, which is then ignited, producing a violent explosion within a gopher's burrow is also available. Through a concussive force, the burrow(s) and their residents are destroyed. Like fumigants, this device should not be used near buildings due to leakage and the potential damage caused by the explosion. These devices are very loud and should not be used in residential areas. Additionally, these devices can start fires when used in dry areas. Caution must be exercised when using this approach.

*Always read and follow label directions when using pesticides. Stephen Vasquez, UC Cooperative Extension Farm Advisor in Fresno County and Roger Baldwin, UC Statewide IPM Vertebrate Pest Advisor stationed at UC Kearney Agricultural Center in Parlier, CA.