



# Vine Lines

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- Management of Gophers
- \$31.2 Million Available for Environmental Quality Incentives Program
- \$2 Million in Conservation Funds Available For Organic and Transitioning Growers
- Trincherro Family Gift Will Support UC Davis Grapevine Program
- Grapevine Regulations in Final Revision Process
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## Management of Gophers

Stephen Vasquez and Roger Baldwin

Vertebrate pests live in and around vineyard settings and can cause significant damage. Damage will depend on the vineyard location, surrounding habitat, and population size of the vertebrate pest in question. Gophers, ground squirrels, and rabbits are the primary vertebrate pests in the San Joaquin Valley and will cause long-term damage if left unchecked. Gnawing on grapevine roots and trunks will lead to large patches of dead vines. These pests can also damage irrigation systems and cause erosion by diverting water via their burrows. Al-

though these pests have natural predators, growers should not rely on them solely for controlling large populations of vertebrates. Recently, Roger Baldwin and I 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 will typically be plugged, 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

Feeding mostly on root systems of herbaceous plants, gophers will sometimes pull entire

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## \$31.2 Million Available for Environmental Quality Incentives Program

Applications for the popular Environmental Quality Incentives Program (EQIP) are being accepted for funding consideration in fiscal year 2010 from now through **January 15, 2010**, at USDA Natural Resources Conservation Service (NRCS) offices throughout California. Conservation cost-share programs provide financial and technical assistance

to farmers and ranchers for natural resource improvements.

Two parts of EQIP have an extended sign-up period, the organic initiative and combustion engine emissions reduction initiative. These two facets of EQIP are only in their second year and producers may need extra time to enroll. The engine emissions reduction portion has \$13.4 million

available and the organic initiative has \$2.4 million available. Sign-up is open until January 29 for both special initiatives.

"All Farm Bill programs provide agriculture producers an incentive to improve the environment and the functionality of their operations, but EQIP is our flagship conservation program," says NRCS State Conservationist Ed

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# Gophers

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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.

## Management

### Traps

Traps, when set correctly, work well against gophers. Traps, like all control methods, are most effective when populations are low. Several types are available, but the two-pronged pincher types are the most popular (Fig. 1).

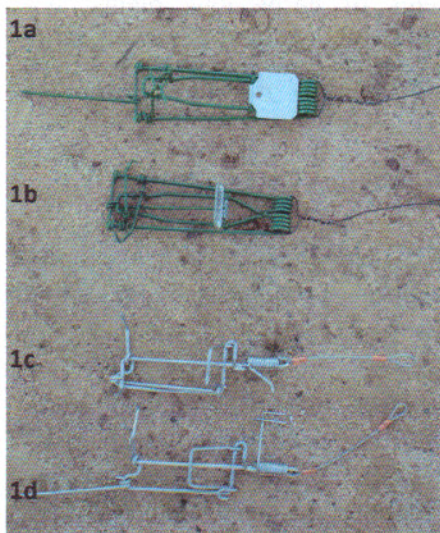


Figure 1. Two types of traps. 1a and 1c are not set. 1b and 1d are set and ready to place in a burrow.

When populations are high, trappers will need to focus their efforts in localized areas with high activity, setting traps multiple times throughout the season. Once gophers are controlled in those areas, new efforts should expand out from these centralized areas until the whole vineyard has been controlled.

### 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 the fabric covering hole to help exclude excess light and encourage the gopher to continue using the tunnel. However, covering does not appear to influence capture success, so if setting numerous traps in a vineyard, leaving openings uncovered can save valuable time.
- Monitor traps daily, moving and resetting in a new location if necessary.

### Baiting\*

For large populations, toxic baits have often been used and can

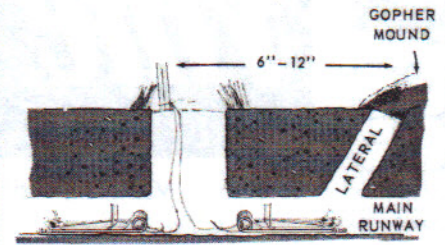


Figure 2. Gopher traps facing in opposite direction.

require less time to apply. Three different types are available to grower: Strychnine<sup>1</sup>, zinc phosphide<sup>1</sup>, and anticoagulants<sup>1</sup> (diphacinone and chlorphacinone). Baits can be applied by using hand applicators or by a tractor driven mechanical applicator that makes a pseudo tunnel.

### 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 will encourage the gopher to seal the burrow.
- Dispense bait into tunnel through probe.
- Cover the opening with soil or a rock to exclude light. Place soil around the rock or object covering hole to help 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.

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# Gophers

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<sup>1</sup>. May be restricted use material depending on such aspects as concentration of the active ingredient, method for applying bait, and where bait is applied. Restricted use materials require a permit for purchase and use.

## Mechanical Applications (Burrow Builder)

- Determine soil moisture. Soil should contain enough moisture so the pseudo-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).
- Pseudo-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 in order to maintain the integrity of the pseudo-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\*

Many fumigants are not very effective against gophers due to their ability to detect and seal off tunnels quickly. However, aluminum phosphide<sup>1</sup> works well during the late winter or early spring months when the soil is moist. Soil moisture helps retain the gas within the burrow. Burrows should be located using a probe and tablets dropped into the hole and sealed. 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 resultant gas into buildings.

<sup>1</sup> 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 gophers burrow is also available. Through a concussive force, the



Figure 4. Mechanical bait applicator.

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.

## Final Thought

Gophers are a difficult species to control given that they reside underground. Because of this, gopher control is costly and time-consuming no matter which approach you use. Therefore, much effort should be made to keep gopher populations low within your vineyards. If you take the time to maintain consistently low gopher populations, you will experience substantially greater savings on gopher control and will likely see greater production from your crops than if you only deal with gopher populations after they reach high levels.

\* Always read and follow label directions when using pesticides.

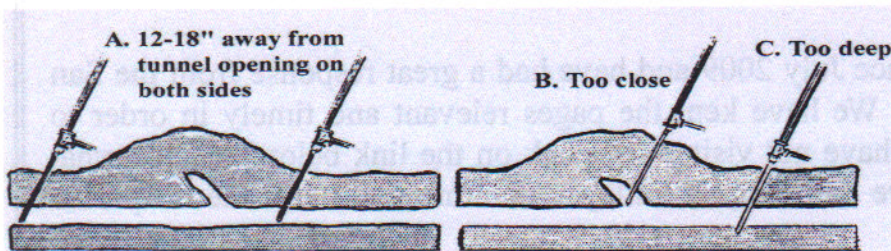


Figure 3. A) Correct application method requires that bait be placed on both sides of tunnel opening 12-18" away. B&C) Poor application methods encourage gophers to seal the burrow.

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