

Assessment of Multiple Approaches for Controlling Gophers in Orchards

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Pocket Gopher Control Options

Pocket gophers cause extensive damage to many crops throughout California. Many tools are available for controlling gophers including trapping, fumigation with aluminum phosphide, poison baits, and the use of a gas explosive device. Trapping gophers has been a common method for controlling gophers for many years. However, a new trap called the Gophinator (Trapline Products, Menlo Park, CA) is now available that may increase efficiency of trapping. Additionally, combining aluminum phosphide fumigation with trapping may increase effectiveness, as gophers will occasionally spring traps without getting captured. In these situations, gophers often become trap shy and are much more difficult to capture. Treating these tunnel systems with aluminum phosphide shortly after trapping could remove these individuals from the population thereby increasing gopher control in vineyards. Poison baiting has often been used to control gophers. Efficacy of baiting has varied widely, although strychnine has traditionally been most effective. Gas explosive devices may also be effective. These devices combust a mixture of propane and oxygen within tunnel systems, thereby killing gophers through concussive force while also destroying the burrow system.

Testing Efficacy

All of these methods are currently allowable techniques for controlling gophers in California, although the efficacy and efficiency of these approaches, particularly in comparison to one another, remain unclear. Therefore, I tested these control strategies at Laguna Ranch, Sebastopol, CA, from 6 April – 8 May, 2009, to estimate the efficacy and efficiency of these approaches. Plots of all three treatment types (trapping + aluminum phosphide, baiting with strychnine, gas explosive device [Rodenator®]) were established within each block. Comparisons

of the number of gopher activity plots that contained fresh gopher mounds and feeder holes before and after treatments showed substantial reductions in gopher sign for all trapping + fumigation plots (range = 74–90% control). No baiting (range = 30–56% control) or Rodenator® (range = 0–55% control) plots indicated substantially reduced gopher sign. The time required to apply each treatment was relatively similar between baiting, trapping, and Rodenator® treatments (90–106 seconds per burrow); fumigation treatments were substantially longer (260 seconds). Approximate costs per acre for each treatment were \$420 for baiting, \$396 for the Rodenator®, and \$252 for trapping + fumigation.

Conclusions

To be effective, control measures need to result in a minimum of a 70% reduction in plots with gopher activity; values of 80–90% are preferable. Trapping + fumigation met this minimum criterion in all three plots, and met the more rigorous criterion in 2 of 3 plots. Even the one plot that fell short of an 80% reduction in plots with gopher activity yielded a 92% reduction in overall gopher activity. In addition to being more efficacious, trapping + fumigation was also more cost effective. Therefore, trapping + fumigation appears to be an effective method for controlling gophers. Baiting and Rodenator® treatments did somewhat reduce gopher activity in most plots, but these levels of control fell well below the minimum threshold for effectiveness (70%). As such, growers may realize short-term benefits from control, but will have to apply equal effort for control the following year, whereas more effective control measures (80–90%) would reduce the cost of control in subsequent years.

Recommendations

- Although controlling pocket gophers is possible year-round, control methods are best conducted from winter through early spring when soil moisture is high. Gophers mound more during this period; identifying fresh mounds is key to effective control.

- Trapping and fumigation with aluminum phosphide appear to be the most effective methods for controlling pocket gophers. Areas should be treated a minimum of two times to increase overall control.

- Baiting and Rodenator® treatments were less effective following two treatment applications. The effectiveness of these methods would likely increase with further applications. However, these added treatments would increase the cost of control.

- The size of gopher populations should be assessed before and after treatment to determine the effectiveness of treatment applications. An easy method to index gopher populations is to establish 20–25 30x30 ft. plots evenly throughout your treatment area. A few days before treating the field, flatten all old mounds within each plot (using your boot or a rake is a good way to flatten mounds). Three days later, check all survey plots for new mounds. Divide the number of plots with fresh mounds by the total number of plots and multiply by 100. This provides an estimate of the percent of your field with gopher activity. Repeat this process 2–5 days after applying control treatments (i.e., baiting, trapping, fumigation, etc.). This will give you the percent of your field occupied by gophers before and after treatment and will let you estimate how effective your control measures were. Ideally, you should work to reduce gopher populations by >80–90% to observe substantial reductions in gopher populations the following year.

Once treatment applications are finished, continue to monitor fields periodically for reinvading gophers. Pay particular attention to the perimeter of fields, as these are the areas that gophers will first reinvade. Controlling gophers along the perimeter of fields will keep gopher populations from building back up throughout your fields.

Training First Leaf Trees

It seems to me that training of young almond trees has gotten increasingly bad over the past few years. Scaffold selection has become a lost art, even with some of the commercial labor companies. It is depressing to visit young, vigorous orchards where trees are being destroyed by scaffolds that have broken out or crotches that have cracked and become infected with disease. There is nothing much a grower can do at that point except prune heavily to reduce the weight of the limbs, reduce the vigor of the trees, make sure the trees are tied very well and replace them as they die from various canker diseases.

Proper scaffold selection is important to minimize scaffold failure. While most growers understand the need to space scaffolds properly around the tree, many fail to space scaffold limbs properly up and down the trunk. Any scaffold limbs originating in the same plane (at the same height) will have a weak attachment and are susceptible to splitting out in later years. Ideally, we want three – five inches of vertical space between each limb. That means if you select four scaffolds, the topmost and bottommost limbs need to be a minimum of 10-12 inches apart.

The angle a limb is attached to the trunk is also important. Bark sometimes becomes imbedded at the base of shoots that are very upright. This leads to weak attachment of the limb and it will likely split out when the first heavy crop sets. Limbs that are too flat tend to lose their vigor and will be overcome by the rest of the tree. Ideally we want to choose primary scaffolds that originate about 45 degrees from the trunk. Unfortunately the ideal tree rarely exists!

Often times the largest, best looking limbs on a one-year-old tree are the very top two or three shoots. Unfortunately, these shoots are fairly upright and originate close together on the trunk. RESIST the temptation to keep more than one (preferably none) of these