

GROWING KNOWLEDGE

Series content is coordinated by Dr. Jay Pscheidt, professor of botany and plant pathology at Oregon State University in Corvallis, Oregon.



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Figure 1: Pocket gophers are rarely seen above ground. PHOTO COURTESY OF LLOYD NACKLEY, 2021. OSU PLANT CLINIC IMAGE, 2020.

The solitary life of pocket gophers

These territorial animals can cause major problems in nursery production

BY DANA SANCHEZ

BOTH MOLES AND GOPHERS can be a menace to nursery production fields.

As these animals look to survive a lack of available food during summer heat or winter cold, they often look to nursery crops, killing them or causing severe damage.

The difference between gopher and mole mounds is readily identifiable. Both animals form dirt mounds when they push excess dirt from their tunnels. Gopher mounds are generally flatter and more fan-shaped than those resulting from mole activity.

Additionally, to close off the surface opening, gophers push out a soil plug. The plug, which may collapse slightly to appear as a dent when viewed from above, will be toward one end of the dirt pile, whereas plugs constructed by moles tend to be in the very center of the cleanout pile.

In this article we will focus on gophers.

Geared for plant damage

Pocket gophers, so-named for their fur-lined cheek pouches or pockets, are among the wildlife species that can provide a vexing challenge to Oregon's nursery growers. Several characteristics that make pocket gophers uniquely suited for a highly specialized lifestyle also can set the stage for conflict with nursery production.

Natural selection has exquisitely designed pocket gophers to be fossorial, meaning that they spend their lives beneath the earth's surface. (Although dispersing juveniles will briefly travel overland to seek their own territory once their mother kicks them out of her burrow system.)

Their body parts are highly modified to maximize their functionality as burrowers. Gophers' strong shoulders power front paws that are equipped with long, strong claws and their palms and toes are fringed with bristles — all to dig better and essentially



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Figure 2: Trapping gophers takes cinch traps, knowledge of gopher behavior and persistence. PHOTO COURTESY OF GABE SACHER, 2021.



“swim” through the soil. Gopher diets consist of roots, bulbs, tubers, grasses, seeds, and even tree bark not to mention your nursery plants.

Forbs and herbaceous plants are often

cut aboveground or pulled into the burrow from below, then stored within the burrow system.

Gophers are active day and night, year-round. They do not hibernate or estivate,

meaning that there is no seasonal break from their activities. Although most breeding takes place in spring–early summer, in areas with continuously green (or irrigated) forage, reproduction might take place year-round.

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Pocket gophers do serve vital functions in the ecosystems on which we are mutually dependent. Their burrowing moves significant amounts of soil — and thus nutrients that have leached deep — back to the root zone and surface. The tunnels allow deep penetration of surface drainage, which can reduce erosion and increase moisture retention.

However, where their burrow systems overlap with agricultural crops and infrastructure, gophers can pose real problems.

Burrows are bad news for ditch banks, canals and irrigation recirculation systems, for example. Gopher feeding on roots can weaken, kill or just reduce the quality of trees. Mounds of dirt ejected from burrows can foul equipment or be a hazard for people work in the fields. Once summer makes green and succulent forage scarce, young trees can suffer girdling as gophers venture out to find whatever food is available.

Gophers support the community of natural predators, including hawks, owls, coyotes, foxes, weasels, snakes, and where they occur, badgers. Those native natural predators in turn contribute to control of other potential pest species. However, predation alone may not be sufficient to prevent gopher populations from having an economic effect on a crop.

Habits dictate control methods

Oregon hosts five species of pocket gophers. In the Willamette Valley, we're most likely to encounter two of those species, the Camas pocket gopher (*Thomomys bulbivorous*) and the western pocket gopher (*T. mazama*), although the geographic range of Botta's pocket gopher (*T. bottae*) makes it another possibility. Regardless of species, management of pocket gophers should consider both the animal's ecology and the scope and stage of the problem.

One factor on the nursery manager's side is that gophers are highly territorial, so when you've identified one burrow system, there's one gopher with which to deal. Determining where one system ends and the neighboring one begins can be a little trickier.

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tolerate their own offspring until they're old enough to disperse and find their own places to live. That might not seem like something worthy of our notice as we seek to manage the little beasts' effects, but it can be helpful if working on a limited sized patch (<5 acres) and especially in the earliest stages of a field being "discovered" by gophers.

Early detection of a new or returning gopher presence is a best-case scenario in which trapping (several models, including 2-pronged pincer or box squeeze) can be effective. Advantages to trapping are that it is a safe and toxin-free approach that any worker can learn to do effectively without additional qualifications. However, trapping is a labor-intensive method that involves probing the ground to find the active burrow, excavating room for the trap, and checking the traps.

In other regions, flood irrigation provided a cheap and relatively simple means of control. However, even in limited cases where this might still be an option, a manager must be vigilant for signs of returning survivors or pioneering dispersers from nearby populations. They must consider whether the flood irrigation might backfire to increase production of understory vegetation that could provide food (and an open invitation) for gophers.

Additional management methods

In established populations or those that occupy more than a few acres, other management methods should be consid-

ered. The "best" approach will vary with the particular combination of factors present: For example, colony size/extent, age of field, soil type and moisture, topography, understory vegetation, and other issues need to be considered.

Where possible, habitat modification should be considered as a baseline practice in order to reduce the "carrying capacity" available to gophers. In other words, if we don't build it (lots of moist food), not as many of them will come.

Varying understory crop types might offer one solution: Whereas pocket gophers relish grasses and forbs, they do not like certain crops. An example is provided by some hay producers who plant 50-foot buffer strips of grain around their fields to create a "wall" of unsuitable habitat between the gophers and their hay crop.

Population reduction beyond the smallest, trappable situations will likely require restricted use products, such as pesticide-treated grain baits, which require a pesticide applicator's license. Products such as zinc phosphide are not species-specific in their effects, in other words they can be lethal to anything that ingests them.

Any pesticide product must only be used according to the terms of its label, including crop type (and sometimes growth stage), target pest species, and other conditions such as means of delivery or application. Delivering such a product in the burrow systems allows us to reach the target animals without putting others

at risk. Baits can be delivered via hand-baiting (also known as probe-baiting), in which a probe is used to first locate the main runway between two mounds and then to deliver the prescribed amount of bait. Over large level areas with few rocks, where trees are widely spaced, and where disturbance of the soil is feasible, mechanical burrow-builders (also known as torpedoes) can be pulled behind a tractor to administer baits efficiently and economically. The burrow-builder opens an artificial burrow, deposits bait, and then rolls the top of the incision closed to exclude light.

Exclusion, frightening, and repelling through smells or tastes, including "gopher plant" (*Euphorbia lathyris*), have not been proven effective in management of gophers or their effects on crops.

Trained and licensed private contractors, including Wildlife Control Operators (http://www.dfw.state.or.us/wildlife/license_permits_apps/wildlife_control_operator_contacts.asp#WCO_Contacts) are one option to consider when making a management plan. Agricultural producers can also request technical assistance by consulting with the U.S.D.A. Animal and Plant and Health Inspection Service (APHIS; 1-866-487-3297) ©

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