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The Pocket Gopher

By Matt Oliver

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Article by Matt Oliver
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Pocket gophers (*Tomomys* spp.), so named for their fur lined cheek pouches located outside the mouth on each side of the face, are burrowing rodents. They are a serious and difficult to control pest for both the Agricultural and Landscape Industries, as well as the homeowner. They destroy vegetation, damage machinery (such as mowers), damage irrigation systems and underground wiring, and lower the aesthetic value of the landscape. In addition, their burrowing activity on slopes causes erosion and can be a major factor in slope weakening and instability that may ultimately lead to a slope failure. Pocket gophers were identified as a major contributing factor to slope failure in a number of recent litigation cases in California.

Biology

A thorough understanding of gopher biology and habits is helpful, if not necessary, to a successful control program. They are medium sized rodents with the head and body ranging in size from 6–8 inches (15–20 cm) long. They have a powerfully built upper body, short neck and legs, long clawed forefeet, and two pairs of large incisors protruding beyond the mouth. These fossorial features are tremendous adaptations for their

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underground existence. They have a keen sense of touch, thanks to their tail (short and sparsely haired) and vibrissae (whiskers), which serve as sensory organs helping to guide the gopher throughout its burrow system. Fur color is highly variable, ranging from dark brown to very light tan.

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Pocket gophers do not hibernate and are thought to be active year round even with snow on the ground, but do noticeably decrease surface feeding and mounding in very hot weather. Females produce 1–3 litters per year with an average size surviving brood of 5–6. In unirrigated natural areas breeding

season is after the rains begin — which may mean only one litter per year. In irrigated, landscaped areas the continual source of green foliage allows the female to raise 3 litters per year.

They are territorial, anti-social, and live solitary except during breeding periods and when the young are being raised. Gophers live almost exclusively underground, venturing above only to push excavated dirt from the burrow system, graze on vegetation near burrow openings, or for the purpose of migrating into new territory. Migration occurs both by adults — usually as a result of unfavorable environmental conditions and/or habitat destruction (e.g. construction projects), and young which the mother expels from her burrow system when they are about half grown.

Burrow systems consist of a main tunnel, lateral runs, pop holes, and various other functional tunnels and enlargements which are used for nesting, storage (food caches), resting, eating, etc. The main burrow is usually 2–4 inches in diameter (averaging 2 1/2") and is 2–18 inches below and parallel to the ground surface. Burrows of young may be small, covering only one or two hundred square feet while those of older pocket gophers may cover an area as large as three thousand square feet. Lateral runs branch off the main run and are used primarily to push excavated soil to the surface. The mounds from these laterals are crescent shaped because the soil is pushed with the forefeet out of the angled lateral to the front and sides of the opening. Pop holes usually lead straight from the surface to the main run and are used as an access for feeding on nearby vegetation. All runs leading to the surface end in a soil mound or plug which keeps the system completely

enclosed — allowing no light to enter, and stabilizing burrow temperature and humidity as much as possible. If a gopher dies, irrigation or rain washes the loose soil plugs from lateral runs and pop holes leaving open tunnels. Drainage tunnels are used for water run-off, thus making it difficult to drown a gopher in a well established system.

The rate of mound building varies with the season, temperature, and soil condition, but averages 1–3 mounds per day, during active periods. The depth of active burrows is usually deeper under hot conditions, especially in non-irrigated or infrequently irrigated areas. Mounding often sharply decreases in the heat of Summer followed by intensive mounding in the Fall. This renewed Fall activity has often been blamed on reinvasion of areas thought to have been controlled in the early Summer.

Control

Although many different techniques have been used in gopher control the most successful programs usually utilize one or more of the following methods: trapping, fumigation, and poison baits.

Trapping is an effective method in small areas such as a homeowner situation, or as a follow up to fumigation or baiting, but is time consuming and thus not very cost effective in a large scale program. The most commonly used traps are the Macabee trap and the box trap. Traps should always be placed in the main burrow.

To locate the main burrow, look for the freshest mounds since they indicate an area of recent gopher activity. You will usually see a small circle or depression representing the plugged lateral tunnel. This plug is generally surrounded on one side by soil, making the mound form a crescent shape. The main tunnel is usually found 3–1/2 inches from the plug side of the mound, and is most often between two mounds. Locating the main burrow usually requires practice, but your skill will improve with experience.

After locating the main tunnel, open it with a shovel or garden trowel and set the traps in pairs facing the opposite directions. This is necessary in order to intercept the gopher coming from either end of the burrow. The box type is easier

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for most inexperienced trappers to set, but requires more excavation. Box traps are useful when the diameter of the gopher's main burrow is small (less than 2 1/2 inches) since small burrows will need to be enlarged to accommodate the box traps. All traps should be wired to stakes to prevent loss. After setting the traps, exclude light from the burrow by covering the opening with dirt clods, sod, cardboard, or some other material. Fine soil can be sifted through the edges to ensure a tight seal. If light enters, the gopher may plug the burrow with soil, filling the traps in and making them ineffective. Check traps often and reset when necessary. If no gopher is caught within 3 days, reset the traps in a different location.

Poison baits offer the quickest and most effective method of controlling a large gopher infestation. The most commonly used toxicants are chloraphacinone, strychnine, and zinc phosphide pelleted bait. Chloraphacinone, the lesser used of the toxicants, is a multiple dose anti-coagulant that prevents the normal process of blood coagulation ultimately causing death from internal bleeding. It has limited field use because of the

necessity of making multiple applications in the same burrow system, but may be useful where an extra margin of safety is desired. The acute toxicants, strychnine and zinc phosphide, are the most used and most effective. Most baits are prepared on hulled wheat, barley, or milo grains, with wheat seeming to be the most preferred by the common Battae (*T. bottae*) gopher. Zinc phosphide baits are only accepted adequately in blended pelleted bait. Strychnine alkaloid bait comes in various formulations ranging from .25% to 3.0%. In instances where a tractor pulled mechanical bait applicator is used, formulations from 1.8% to as high as 3.0% can be utilized. The burrower building mechanical bait applicator is seldom used in urban situations. Zinc phosphide can be obtained in 1.0% to 2.0% formulations.

One registered burrow fumigant, aluminum phosphide, is very effective when used under ideal conditions. Soil should be moist to accommodate gas formation and to provide a good soil seal. Even though the gopher often detects burrow fumigation efforts and tries to plug the system, the use of aluminum phosphide can still be very effective if at least 2 points within the burrow system are treated at the same time. The material is used in pellet form with the pellets being placed into the runway using a 5/8 to 3/4 inch probe to open the system and a gloved hand to

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drop them in. A dirt clod, rock, or plant material is then placed over the probe hole. This product can be very hazardous and must be used according to label directions, as with all pesticides, and requires a restricted materials permit.

Note: Use of strychnine and zinc phosphide baits and the fumigant aluminum phosphide require restricted material permits and user certification.

Many factors influence the success of a baiting program; proper bait placement within the gopher system, environmental factors such as soil type, soil moisture, and availability of green forage. All can enhance or hinder bait acceptance, and control results. For instance, dry sandy soils often will collapse when probed, preventing any bait application, while overly wet soils may cause the bait to become soggy, muddy, and quickly mold, thus making it unacceptable to the gopher.

The types of available plants affect how quickly gophers accept bait. For example, gophers are controlled more easily in turf than in O'Connor's Legume as the latter is the preferred host.

Finally, gophers may become "bait shy" if they ingest sublethal amounts of a bait and become sick. Because the animal associates the sickness with the taste of the bait, it will no longer feed on it. Once this occurs, another type of bait or alternative control method should be used.

Any gopher population can be controlled and in many situations even eliminated. Successful programs in large scale situations generally require an initial clean-out of intensified treatment to bring the existing population to a maintainable level (90% or better). Once control is achieved a continuous maintenance program will most often be required to prevent reinfestation problems from developing as a result of migration from heavily infested surrounding areas.

About the Author:

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Pocket Knives: How To Choose The Right One For You

By Gabriel Adams

Pocket knives are convenient tools that can come in handy for most anyone. Men and women alike can benefit from the convenience of having a pocket knife. They are useful for occasional use and for emergencies. If you are an avid camper or traveler, a pocket knife that has multiple uses can be especially convenient. When faced with an emergency situation, the pocket knife can be used to saw wood, kill fish and prepare meals. For convenience, you can have a handy bottle opener and corkscrew which may not be readily available in all situations.

How to choose the right pocket knife will depend on your needs. If you want something to carry around with you at all times, a smaller, multipurpose pocket knife might be best. For professionals, a nice engraved pocket knife that has a knife and possibly a few other tools will be perfect. They can be purchased at home improvement stores, accessory stores and knife stores. Executive pocket knives can fit into a purse or briefcase easily and look elegant as well. They retail between ten and fifty dollars and can be personalized as well.

For more practical knives, such as a kind you may keep in your automobile or for use on camping trips, go for the multi tool pocket knives. The Swiss Army knives are the most popular and there are a variety of sizes available. These tools range from approximately thirty dollars to two hundred dollars. There are multiple tools that will go with them such as different sized blades, nail file, scissors, saw, corkscrew, screwdriver, can opener, toothpick, tweezers and magnifying glass among other options. The multi tool pocket knives are a little thicker than smaller knives but they still are small enough to fit into a pocket, purse, briefcase or backpack. Choose the pocket knife that is best for you by considering use and price.

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