

# Northern Pocket Gopher

## — Biology and Management

**N**orthern pocket gophers (*Thomomys talpoides*) live underground year-round in burrow systems that are often extensive and elaborate. Their range in southern Manitoba, as shown on the map on the back of this publication, includes some of our most important cropland. Their survival dictates spending warmer months collecting food to tide them over winter. Capable of surviving extremely harsh conditions, pocket gopher populations can expand rapidly when conditions are good. Unfortunately, good conditions are created when farmers grow high quality forage crops, like alfalfa, that they prefer to feed on. Pocket gophers can quickly ruin a field of alfalfa by feeding on taproots and smothering new growth with soil they push out of their burrow entrances.



Plains pocket gopher

photo: University of Nebraska

### What are pocket gophers?

Pocket gophers are medium-sized rodents, ranging from 21 to 38 centimetres long and weighing 94 to 104 grams. They are well suited for a life below ground. Their name refers to the large, fur-lined external cheek pouches they use to carry food as they scurry through underground tunnels. The cheek pouches

can be turned inside out when empty. Pocket gophers have stout forefeet with large claws for digging and continuous growing incisor teeth that are always exposed in front of the mouth opening. They have small but functional eyes and ears.

Sometimes confused with ground squirrels, northern pocket gophers are easily distinguished by their nearly naked tails. The pocket gopher actually uses its tail as a sensitive navigation tool that allows it to travel backward quickly through its tunnels. Ground squirrel cheek pouches are inside the mouth, not on the outside of the cheek like the pocket gopher's cheek pouches.

While ground squirrels leave open holes leading to their burrows, pocket gophers usually leave only a fan-shaped mound to indicate where there may be a burrow. Actual entrances are sealed. Like moles, pocket gophers are rarely seen above ground, living most of their lives underground. They do not hibernate and they do not show a preference for activity during the day or the night.

## Trapping

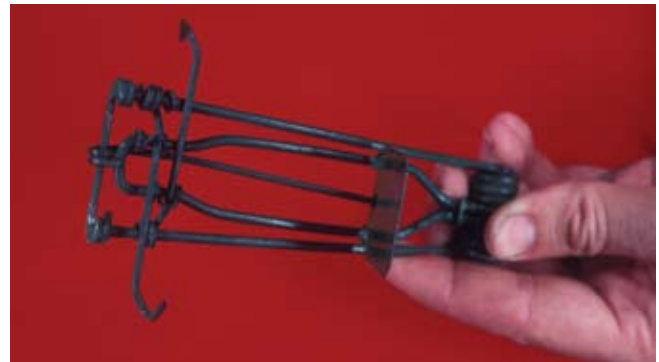
A three year study was conducted by the University of Manitoba to evaluate the efficiencies of four types of traps used in Manitoba. The traps were rated on the numbers of gophers caught per trap set, the time taken to set and check the traps and how often they were set off or plugged without catching a gopher. The average efficiency of all the traps studied was 44 per cent, with a gopher trapped every 35 minutes. The table below shows results for each type of trap studied.

The results were:

Trap Name	Trap Type	Efficiency Rate (%)
Macabee®	Impalement	51.5
Wooden Box®	Snare	46.8
Black Hole®	Snare	42.8
Easy Set®	Impalement	42.8

Research in Alberta has shown that trap success rates may be improved if the traps are placed in a perimeter around a field.

Rapid rates of invasion into clean fields and the rapid rate of reproduction call for a co-ordinated approach to control pocket gophers on a community level.



Macabee

photo: University of Nebraska-Lincoln Extension



Black Hole



Wooden Box

## Predators

Predators that eat pocket gophers include hawks, owls, foxes, coyotes, and weasels. Encouraging these species, or not discouraging them, may help reduce gopher populations. Young pocket gophers are particularly susceptible to predation when dispersing above ground to new locations. Predators alone won't eliminate gopher populations because, when prey grows scarce, predators move to better hunting grounds. Other techniques must be combined when the goal is to manage pocket gophers effectively.



Plains Pocket gopher

photo: University of Nebraska

Though both species spend a lot of time underground, pocket gophers do not look like moles. They don't eat the same things, either. Pocket gophers eat vegetation only, while moles prefer mostly insects and invertebrates.

## Why are they a problem here?

A single northern pocket gopher's burrow system can span an area up to 75 square metres. Some members of the pocket gopher family have been shown to create tunnels exceeding 100 meters in length. In areas of high population, unseen tunnels may cover huge areas of land. Estimates say pocket gophers are present in over 500,000 hectares of agro-Manitoba. They are a major problem for many agricultural producers.

Part of what makes pocket gophers pests is the burrow system they construct and the surface mounds that result. Reduced farm machinery efficiency, damage to harvesting equipment, higher cropland preparation costs and forage quality loss due to loose soil incorporated in bales are all expensive problems that reduce farm income.

Pocket gophers graze primarily on underground taproots but will also eat above ground vegetation. They can reduce alfalfa yields indirectly by smothering young plants with the soil mounds they push to the surface. Manitoba Agriculture, Food and Rural Initiatives estimated in 1996 that pocket gophers were responsible

Mating season for pocket gophers lasts for up to six weeks after spring thaw and birth occurs after 21 days gestation. In Manitoba, they have one litter of four or five per year and the young remain with their mothers for five to eight weeks before dispersing.

The northern pocket gopher has a wider tolerance for different soils and consumes a wider range of plants than any other pocket gopher. This likely explains why this particular rodent is found further north and in more marginal situations than any other species in its family.

Despite differences in range and habitat, the northern pocket gopher behaves the same as its cousins elsewhere. It is a digging creature that constructs a complex burrow system to locate and gain access to food. The burrows provide year-round shelter from predators and weather. Gophers also use them as transportation corridors in which to disperse and find mates.



Pocket gopher mound

for producer losses of \$15 million to \$22 million per year. Losses have only increased since then.

Ideal pocket gopher habitat has abundant forbs and light, porous soils with good drainage. These make firm tunnels with adequate gas exchange. This profile could describe most of the alfalfa fields in Manitoba. Studies



Pocket gopher mounds in alfalfa can reduce yield and stand longevity, and damage equipment.

show pocket gophers prefer alfalfa over native grasses, partly because of alfalfa's high water content, so it's no coincidence that many alfalfa producers are the most affected. Pocket gopher damage in alfalfa reduces stand longevity and has been shown to result in an average yield loss of 23 per cent.

Though they are also found in almost any soil, including roadbed gravel and clay, from mowed roadsides to open forest edges, the density of pocket gophers in a given area is directly proportional to food supply. Where forbs are dense, the home range of a gopher can be half of what would be needed in an area with less food also meaning twice as many gophers could potentially inhabit the area.

High levels of gopher infestation has been reported as the second most common reason Manitoba farmers choose to terminate and plough under alfalfa crops.

Northern pocket gophers provide some benefits, but these must be weighed against the damage they cause. Burrowing pocket gophers increase soil fertility by adding organic matter in the form of plant material and feces. Their burrowing increases soil aeration, and water infiltration, reduces compaction and increases the rate of soil formation by bringing subsoil to the surface where it is improved by weathering. Earthworms do the same things, but without damaging crops in the process.

## Crop management

**P**ocket gopher damage can be reduced by planting crops that can tolerate their feeding, or by managing crops so populations of pocket gophers are less likely to build to high levels. Three crop management methods that can help minimize pocket gopher damage are:

1. Selecting appropriate crop varieties—alfalfa varieties with several large roots rather than a single taproot suffer less when pocket gophers feed on them.
2. Crop rotation—using grain in the rotation results in habitat incapable of supporting pocket gophers. Annual grains do not establish large underground storage structures and do not produce enough food for pocket gophers to survive on year round.
3. Grain buffer strips—buffer strips of grain planted around hay fields provide unsuitable habitat around the field. This can reduce immigration by pocket gophers.

## Controlling pocket gophers

Farmers, pesticide companies and researchers have tried many methods of controlling pocket gophers, some more successful than others.

It is important that the controls used are legal, effective and relatively inexpensive. For obvious reasons, control schemes should not endanger humans and should not endanger other wildlife. They should also be environmentally friendly and as humane as possible.



Plains pocket gopher

photo: University of Nebraska

## Rodenticides

Rodenticides are poisons used to control rodent populations. They are usually delivered in bait applied to pocket gopher burrows by hand probes or with tractor-drawn applicators.

There are three rodenticides registered for use in the control of pocket gophers in Manitoba (see below). Studies in Manitoba have indicated that strychnine-based poisons are most effective in the fall, and chlorophacinone based poisons are most effective in the spring. A Manitoba test of zinc phosphate showed a spring application to be most effective in reducing mounding activity.

1. **Chlorophacinone** and **diphacinone** are anticoagulants that are delivered in bait and require multiple feedings to be effective. They interfere with blood clotting and the ongoing repair of tiny blood vessels, causing the victim to bleed to death usually within three to four days after ingestion. They are most effective when used before spring green up or in the late fall.
2. **Strychnine** is a highly toxic, colorless, crystalline alkaloid. Delivered in bait, it quickly enters the blood stream and interferes with the central nervous system, resulting in convulsions and death from exhaustion and respiratory failure. Symptoms will appear within five to 30 minutes after ingestion.

3. **Zinc phosphide** delivered in bait releases toxic phosphine gas when it comes in contact with stomach acids. The gas is rapidly absorbed into the bloodstream, affecting the function of the internal organs including the lungs, resulting in asphyxia. Zinc phosphide should be rotated with other toxic materials in a baiting program so that pocket gophers do not develop a taste aversion to it.

All of these rodent-killing agents can also be highly toxic to humans, other mammals, birds and fish. They must be handled with extreme care.

Many factors can influence bait acceptance and the success of a baiting program. Among them are proper bait placement, soil type, soil moisture and availability of green forage. Rotating rodenticide types can also improve success.



Artificial burrow builder

## Pocket Gopher Distribution in Manitoba – 1996.

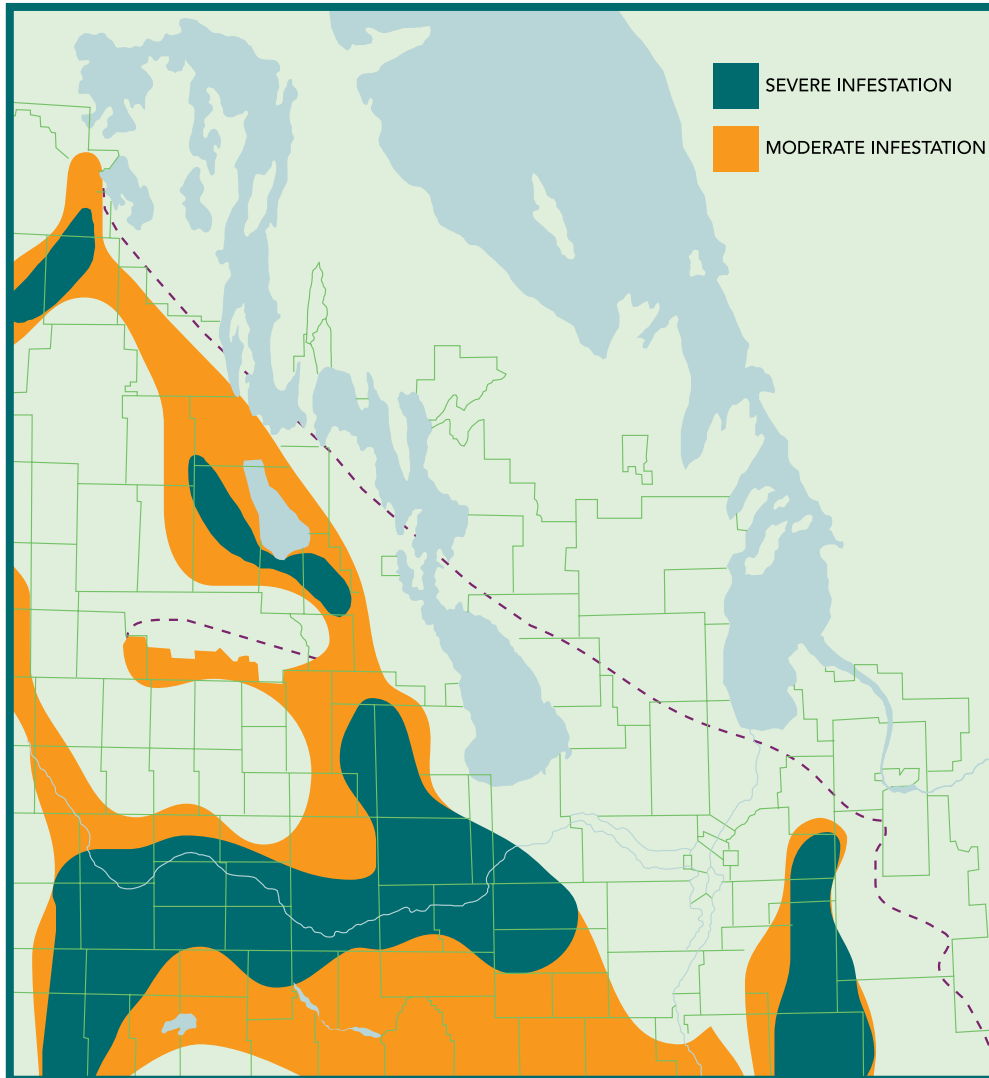


Illustration adapted from data from The Manitoba Museum

**For more information on pocket gophers in Manitoba,  
contact your local Manitoba Agriculture, Food and Rural Initiatives office  
or visit us online at [manitoba.ca/agriculture/production](http://manitoba.ca/agriculture/production)**

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