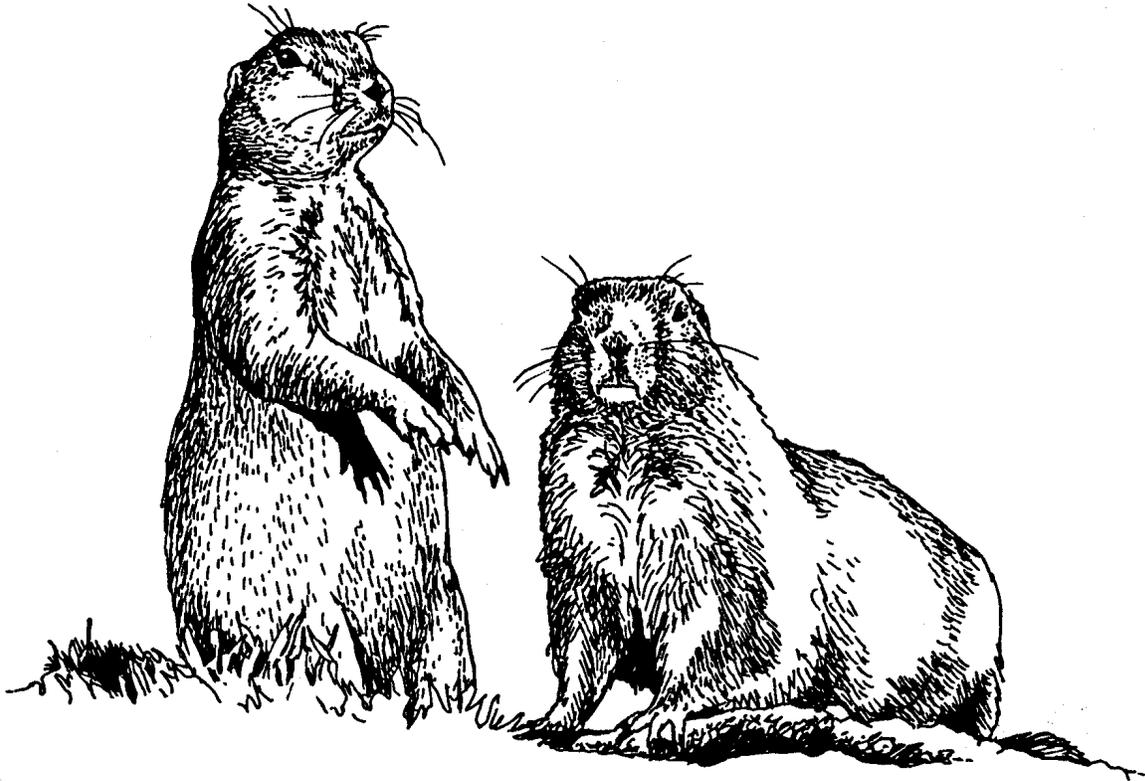


PRAIRIE DOG MANAGEMENT



**MONTANA DEPARTMENT OF AGRICULTURE
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HELENA, MONTANA 59620-0201**

THE BIOLOGY AND CONTROL OF THE BLACK-TAILED PRAIRIE DOG

BIOLOGY

The black-tailed prairie dog (*Cynomys ludovicianus*) is the largest member of the ground squirrel family found in Montana (Fig. 1). This yellowish tan to reddish colored rodent is easily identified by its short tail (about $\frac{1}{4}$ of the total body length) which is black tipped.



Fig. 1. Black-tailed prairie dog.

Adults range in size from 13 to 15 inches and weigh between $1\frac{1}{2}$ to 3 pounds. In contrast, white-tailed prairie dogs have a white-tipped tail. White-tailed prairie dogs (*Cynomys leucurus*) are smaller than black-tailed prairie dogs at 12 to 14 inches and weigh 1 to 2 pounds. Since white-tailed prairie dogs are quite rare in Montana and classified as a species of concern, this paper will focus only on control of black-tailed prairie dogs. If you have conflicts with white-tailed prairie dogs, please contact a representative of the Montana Department of Agriculture (MDA) listed at the end of the document.

The black-tailed prairie dog is gregarious and lives in colonies usually referred to as "towns". Prairie dog towns are found scattered in the short grass prairie regions of central and eastern Montana (Fig. 2). Prairie dog towns contain an abundance of burrows which appear as cone-shaped mounds of packed soil up to 2 feet high. Population densities can vary from five to 35 prairie dogs per acre.

Prairie dogs feed mostly on grasses and forbs from which they also obtain needed water. They will readily consume seeds, grain, grasshoppers and other insects when available. Although prairie dogs do not routinely hibernate, they can become dormant for short periods during cold weather.

Breeding usually begins in March. After a 30-day gestation period, mated females give birth to one litter of four to six young during April to May. Four to six weeks later, young appear above ground. With this reproductive rate, prairie dog numbers can increase between 40 to 100 percent each year, but typically only increase 27 percent each year.



Fig. 2. Range of black-tailed prairie dog in Montana.

DAMAGE

The economic impact prairie dogs have on producers is a complex and hotly debated topic. On the one hand, we must acknowledge that prairie dogs provide many environmental and social benefits. Their burrowing creates vital habitat for numerous animal and plant species, including being an important prey source for many predators. In addition, prairie dogs provide numerous recreational opportunities important to western lifestyles, such as wildlife observation, photography, sport shooting, and interpretive and scientific uses.

On the other hand, prairie dogs conflict with human interests by consuming and clipping grasses and crops. These behaviors, when combined with other factors, such as overgrazing and drought, can damage root systems of desirable plant species and increase the presence of undesirable plants, such as cacti.

The decision to control prairie dogs depends on several factors, including personal preferences, quality and value of the pasture/crop, cost of control and other concerns. One guideline suggests that control becomes economically viable (i.e., the benefits of control outweigh the costs) when prairie dogs occupy 30 percent of the land area or have created 10 or more mounds per acre.

LEGAL STATUS

Black-tailed prairie dogs are designated as nongame animals under Montana Fish Wildlife & Parks (MFWP) unless designated as vertebrate pests under MDA (MCA 80-7-1101). As a vertebrate pest, landowners may have prairie dogs controlled any time of year. Hunting or trapping licenses are not required. Landowners and land-renters can control prairie dogs by a variety of methods including using pesticides registered with the MDA. Relocation or translocation of prairie dogs is prohibited without permission from MFWP. Permittees on land managed by the Bureau of Land Management (BLM) and U.S. Forest Service are prohibited from using pesticides to control prairie dogs.

Endangered Species Concerns

Before initiating any control of prairie dogs, consider the effects on non-target species. Though endangered species bulletins (available at <http://www.epa.gov/espp/>) must be obtained prior to use of pesticides, we encourage everyone to consult them prior to controlling prairie dogs regardless of the method. In addition, applicators should contact the U.S. Fish and Wildlife Service (USFWS, 406-449-5225) to determine if the location has been cleared for use of pesticides for the control of prairie dogs.

Of all the wildlife species which may be found in prairie dog towns, the black-footed ferret (*Mustela nigripes*), a natural predator of prairie dogs, may be the animal most adversely affected by prairie dog control (Fig. 3). The black-footed ferret is a weasel with a long, thin body, a distinctive black mask, black feet and legs and a black-tipped tail. It is classified as an endangered species. Prairie dog towns reaching at least 80 acres in size should be thoroughly searched for evidence of the black-footed ferret before control is initiated unless cleared by the USFWS. Note that some pesticide labels may require other restrictions, such as field inspections as well as clearance from USFWS. Techniques for identification of black-footed ferrets or their signs may be obtained from the MFWP (406) 444-2535 or the USFWS.



Fig. 3. Black-footed ferret.

CONTROL TECHNIQUES

When prairie dog damage reaches levels where you believe control is needed, select control method(s) that fit your goals while following both regulations and safety requirements. You must establish clear goals as they will determine which control methods you should select. For example, if your goal is to prevent the town from growing, then you should seek to remove 30 to 55 percent of the prairie dogs on an annual basis. To achieve long-term control, up to four years, the town population must be reduced to 10 percent or less.

Control of prairie dogs is not a one step process. To obtain significant reductions in prairie dog numbers (80 percent or more) the application of at least two lethal control methods in a single year will likely be required. Total eradication in a field will often require at

least two years of effective application of lethal control methods.

In addition to lethal control, disking and/or backfilling prairie dog burrows, deferring grazing, replanting of native grasses and other practices will help to improve the range condition and ultimately reduce the suitability of these areas for reinvasion by prairie dogs.

Habitat modification involves reducing those landscape conditions that favor prairie dogs. Prairie dogs avoid habitats with trees or are subject to flooding. Tall grass discourages prairie dog by blocking their ability to see approaching predators. Understand, however, that tall grass will not stop an invasion or expansion of towns if no other habitat is available. Likewise, erecting visible barriers, such as erosion fencing, will not completely prevent movement by prairie dogs to unwanted areas.

Raptor perches can encourage raptors to linger and predate on prairie dogs in your fields. While raptors can slow the growth of towns through direct predation and reducing litter sizes, it is unlikely that raptors will shrink town sizes to desirable levels on their own.

To encourage raptor predation, place poles, ideally 23 feet tall or higher, every 10 acres or so. Keep in mind, that raptors will hunt what is available, including valued species, such as game birds.

Shooting can reduce prairie dog populations up to 65 percent without the use of pesticides. Higher reductions can be achieved only with highly skilled and dedicated shooters because remaining prairie dogs quickly adapt to shooting pressure. Some shooters recommend using an automated propane cannon several days before initiating a shooting program to condition the prairie dogs to ignore loud noises. Shooters should use non-frangible bullets to reduce lead poisoning of valuable predators that will scavenge the carcasses. Alternatively, if suitable for your rifle, use non-toxic bullets.

Landowners can avoid the costs (in materials and time) required by shooting by permitting

shooters on their land. Some shooters will travel long distances for the opportunity to shoot prairie dogs.

Trapping prairie dogs is another non-toxic way to control prairie dog populations. The downside is that trapping is time intensive and therefore suitable only for controlling prairie dogs in areas up to 10 acres. Check traps daily at dusk, but it is advisable to check traps twice a day, at mid-morning and before nightfall to remove catches and reset. Daily checks are particularly important when using cage traps as trapped prairie dogs could die of exposure.

Body-gripping traps such as the #55 or #110 conibear-style are set directly in front of or over a burrow entrance (trigger wires pointing up) and anchored securely to the ground by inserting a stake between the jaws of the set trap and pushed into the ground (Fig. 4). Bait is not required as the prairie dog will trigger the trap when it hits the trigger wires. Conibear-style traps are designed to kill the prairie dog. Although generally safe, dogs, weasels, skunks and other predators may be injured or possibly killed by such traps.



Fig. 4. Conibear-style trap set over a prairie dog burrow. Trap still requires an 18-inch stake.

Some trappers report that prairie dogs sometimes remain in the burrows when traps are placed over burrow entrances. Be patient and ensure that all burrow entrances have traps and that prairie dogs have not by-passed them.

Use single-door cage traps (6- x 6- x 24-inches) in areas where the risk to pets and threatened and endangered species is too great. Bait with oats sprinkled on the treadle. In windy conditions, add corn oil to the treadle to help the oats stick. Be prepared to handle a skunk

before you begin trapping. Skunks have a tendency to enter traps set for other animals. Contact MDA for information on handling trapped skunks. Dispatch trapped prairie dogs by drowning or shooting. Shoot only where legal to discharge firearms and when conditions are safe. Never kill prairie dogs in public view or translocate them to new areas.

Burrow fumigants are pesticides that release toxic gases into a burrow system. When labor and materials are considered, fumigation is at least three times costlier than toxicants. Therefore, fumigation is usually practical only for small towns, when it is unsafe to use poison bait or as a cleanup method following the use of poison bait. Always follow the label when using pesticides.

Ignitable gas cartridges are general use fumigants, meaning applicators do not need a license to use on their own ground. This fumigant kills through the production of carbon monoxide, and consumption of the burrow's available oxygen. After the fuse is lit, place the cartridge (fuse end first) deep into the active prairie dog burrow. The burrow opening should then be plugged with sod, sealed with soil, and tamped tightly with a shovel. Use care not to smother the cartridge with soil when backfilling the burrow. Treat all active burrow openings. Exercise caution when applying gas cartridges in dry conditions to avoid causing fires. Ideally, use gas cartridges after rainfall to reduce fire risk and improve control by reducing gas leakage into the porous soil.

Identification of Active Burrows

Treatment of abandoned burrows not only wastes time and money, it also endangers non-target species.

Active burrows will have smooth openings (4-10 inches in diameter) and be in good repair. Often burrows will have fresh feces nearby. In soft soils, tracks may be visible (Fig. 5).



Fig. 5. A well-maintained prairie dog burrow.

Inactive burrows may have any combination of the following: spider webs, disheveled appearance and partial or complete collapse (Fig. 6). Feathers and white-droppings scattered around the hole often signify the presence of a burrowing owl (Fig. 7).



Fig. 6. An abandoned prairie dog burrow. Note the spider web covering the hole.



Fig. 7. Feathers and white-droppings outside of a burrowing owl den.

Aluminum phosphide is the active ingredient of another burrow fumigant. Unlike ignitable gas cartridges, aluminum phosphide-based fumigants are restricted use, meaning applicators must have a pesticide license to purchase and use. Aluminum phosphide products are sold as tablets (3 grams) and pellets (0.6 grams). When either is exposed to moisture, phosphine gas is released.

Use care when handling or storing aluminum phosphide products. Open canisters away from your face and only when outdoors. Always wear cloth or smooth leather gloves when dispensing the product (Fig. 8). Phosphine gas does not pass through skin, but skin moisture will cause the fumigant to emit phosphine gas. Do not use rubber or chemical resistant gloves as these will increase risk of pesticide exposure by causing hands to sweat. Air out gloves thoroughly before washing or discarding. Never place used gloves or bottles of aluminum phosphide in the vehicle's cab or trunk.



Fig. 8. Cloth gloves with fumigant canister.

Treat towns by starting down wind and work into the wind. Stand up wind or cross-wind when applying tablets/pellets to burrows. Three

or four tablets or 18 to 20 pellets should be placed deep into the active burrow. Some applicators use a 4-foot section of 1- to 2-inch diameter plastic pipe to funnel the tablets/pellets deep into the burrow. Work the pipe as far as possible into the burrow, drop the tablets or pellets into the pipe, remove it, and plug the burrow opening with a cactus clump, sod, or crumpled newspaper. Care must be taken that soil does not cover the tablets/pellets as soil will reduce the rate of gas released. Cover the burrow's plug with loose soil and tamp tight with a shovel. Treat every active burrow opening. When used correctly, fumigation with phosphine gas can achieve control levels up to 97 percent with two treatments. One study found that 183 burrows could be treated in 3½ hours.

Store the fumigant in a secure, placarded, and dry location that is not inhabited by humans, pets or livestock. Follow label instructions carefully.

NOTE: In 2012, labelling of aluminum phosphide products changed dramatically. Some of these changes include:

1. Completion of a detailed written Fumigant Management Plan (FMP). The FMP must be filled out prior to application of fumigant. Templates of FMPs can be obtained from fumigant manufacturers or MDA.
2. Commercial applicators must provide a copy of the FMP to customers prior to any application of aluminum phosphide-based pesticides.
3. Use of aluminum phosphide fumigants is strictly prohibited for treatment of rodent burrows on single or multi-family residential properties and nursing homes, schools (except athletic fields), day care facilities and hospitals.
4. Aluminum phosphide fumigants cannot be applied into any rodent burrow system within 100 feet of a building that is, or may be, occupied by humans and/or domestic animals.
5. Applicators must monitor phosphine gas levels periodically during applications of aluminum phosphide fumigants to ensure that exposure to phosphine gas does not exceed 0.3 parts per million (ppm) for the 8-hour time

weighted average (TWA) or the 15-minute short term exposure Limit (STEL) of 1.0 ppm. If limits are exceeded, vacate the treated area until phosphine gas is reduced below these levels. If it is necessary for someone to remain in the treated area when phosphine gas exceeds these levels, a self-contained breathing apparatus of the type required by the label must be worn.

6. After application, special warning signs are to be placed at access points around the application area. Signs must remain in place for 48 hours. Signs may be obtained from the pesticide manufacturer.

Other restrictions and regulations are on the label and applicator's manual. Be sure to read and follow the entire label, which consists of the container label, MSDS/SDS sheets and the supplemental applicator's manual.



Fig. 9. Hand pump used to draw air into the glass testing tubes containing a chemical sensitive to the presence of phosphine gas.

Propane-oxygen exploders inject a mixture of propane and oxygen into prairie dog burrows, which is then detonated. Prairie dogs die from the concussive force of the explosion. One Montana-based study using a 45-second injection time took three hours and forty-eight minutes to treat 120 burrows to achieve a 65 percent reduction in prairie dogs. While this efficacy is low, it is likely that immigration of prairie dogs outside the treatment area reduced our efficacy rate.

Applicators must use the device carefully. The explosions can result in injuries to applicators

both directly and through flying debris. In addition, the explosions can damage any nearby subterranean utilities. Applicators are encouraged to wear all appropriate personal protective equipment (goggles, ear protection, helmet etc.) and ensure that they stay clear of subterranean utilities, particularly buried natural gas lines. Confirm the absence of below-ground utilities by contacting Montana811 (dial 811) to locate any underground utilities. We suggest using the device following a soaking rain to reduce fire risks.

PERC[®] stands for pressurized exhaust rodent control. This device captures the exhaust from an internal combustion engine and then injects the gas into a burrow. The carbon-monoxide in the exhaust kills the burrowing rodent. While researchers have found it to be effective on pocket gophers and ground squirrels, we are not aware of any scientific testing of its use on prairie dogs. Wildlife control operators claim that an injection time of four minutes per burrow can achieve 90 percent control. Other commercially available carbon monoxide devices include, The Cheetah Rodent Control Machine and Burrow R_x[®].

Toxic grain bait is the most commonly used method to control prairie dogs. The effectiveness of poison grain baits is affected by temperature, weather, activity and food preferences of prairie dogs. For the best bait acceptance, apply baits before spring green-up or after vegetation has dried up in late summer or early fall. Severe drought or open mild winters also provide good control opportunities. Generally, grain bait applied when green vegetation is available is not effective. In addition, avoid applying bait when weather conditions are expected to be poor. Ideally, apply pre-bait and toxic bait when weather conditions are expected to be stable for the next five to seven days. Bait loses its toxicity and attractiveness when exposed to rain or snow.

Toxic grain baits may NOT be used in bait stations unless the label explicitly allows such use for the control of prairie dogs.

Zinc Phosphide Oat Bait

Zinc phosphide is an acute toxicant that kills by disrupting heart and liver function. A variety of manufacturers produce zinc phosphide-treated baits for the control of prairie dogs. The purchase and application of zinc phosphide treated-baits require a commercial, government or private applicator license as they are Restricted Use Pesticides.

Pre-baiting is the application of nontoxic grain two to three days prior to toxic bait application. Pre-baiting improves bait acceptance by conditioning the prairie dogs to a new food source. Before applying pre-bait to large acreages, conduct a bait acceptance test (also called a "pre-test") to determine if prairie dogs will feed on the untreated grain. Select at least 25 burrows. Flag or mark the spots so they can be relocated. Scatter a teaspoonful (Fig. 10) of plain whole oats in a 6-inch circle within 3 feet of each prairie dog burrow.



Fig. 10. Bait dispensers are made easily from copper pipe, split rivets, washers, and 1/4-inch rod. Match the capacity with a baker's teaspoon. Label the dipper for pesticide use only.

Avoid placing the bait directly in front of the burrow entrance to prevent it from being trampled or buried with soil from burrow maintenance (Fig. 11).

Check baited areas the following day to see if the bait was consumed. If results are favorable, proceed to apply pre-bait to the entire town. If bait acceptance is poor, wait until bait acceptance improves.

While pre-baiting doubles the application labor, it is essential to condition the prairie dogs to eat the bait quickly. If prairie dogs consume

the treated bait slowly, they may discover that it has a bitter taste and avoid consuming the 40 grains needed to achieve a lethal dose. **Zinc phosphide bait should be applied only once per year.** Continued baiting with zinc phosphide bait may cause "bait shyness" and control will become difficult and costly.



Fig. 11. Circle shows the placement of bait. Note how it is outside the two trails used by the prairie dog at this burrow.

Before applying the toxic bait, **re-read** the label instructions carefully. Apply the toxic grain in the same way you applied the pre-bait. Do not drop the bait down the burrows or in thick grass. Do not place bait in piles.

Bait may be applied by hand from vehicles, horses or on foot. Use extreme caution when applying grain bait by horseback as horses will be attracted to the toxic bait. Use zippered bait bags which can be closed when not actually baiting. During application, keep excess bait in locked or latched storage to prevent access by children or livestock. For several days after applying the toxic bait, avoid disturbing treated towns to ensure prairie dogs have full access to the bait.

Application of zinc phosphide baits is restricted between July and January or February depending on the label. While those application dates are the best, situations sometimes require control outside that time period. Montana does have a Special Needs Label (MT-05-005) for use with the Bell Laboratories, Inc. ZP[®] Rodent Bait Ag[™] (EPA Reg. No. 12455-17) that allows application outside the typical application season. Applicators must possess and follow the instructions on both the EPA label and the Special Needs Label. The Special

Needs Label may be obtained from your pesticide dealer or by visiting <https://agr.mt.gov/PesticideProducts>.

Anticoagulant Grain Baits

Rozol® (active ingredient: Chlorophacinone) and Kaput® D (active ingredient: Diphacinone) are Restricted Use Pesticides registered in Montana for controlling prairie dogs. These anticoagulant compounds, at toxic levels, prevent blood from clotting. After feeding on these baits several times over a few days, the rodents die of internal hemorrhage. Label instructions are very specific and should be closely read and followed. Two ounces or ¼ cup of bait, which is formulated on grain, must be placed at least 6 inches down the entrance of each active prairie dog burrow. In burrows with a low-grade slope that could be entered by birds, place bait further into the burrow than the required 6 inches (Fig. 12). Never apply bait on the ground surface. A supplemental label provision also allows the use of mechanical applicators to place bait in the burrow.



Fig. 12. In low slope burrows, failure to place anticoagulant bait beyond six inches increases the chances that seed-eating birds will consume the bait.

Two days after bait application and at two day intervals, applicators must search for any sick or dead prairie dogs in the treatment area. Searches must be systematic using a transect method explained on the label (Fig. 13). Any bait found on the surface must also be removed. Carcasses found during post-treatment searches must be disposed of by burial. Livestock are not allowed in the treatment area

for at least two weeks following the application.

Transect Searches

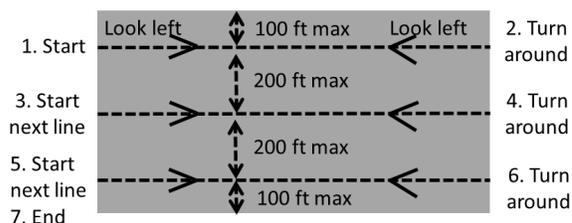


Fig. 13. Place flags to mark the ends of lines across the treated prairie dog town. Transects should be no more than 200 feet apart. Then drive down the line looking left, then turn around and repeat the process looking left so that both sides of the line are checked. Then move to the next transect line.

SAFETY

Store pesticides under lock and key in a dry location away from children, livestock and pets. Always store pesticides in the original, labeled containers that are marked POISON. Buy only enough pesticides for one season's use. Store excess pesticides in a location where the temperature will remain cool. To reduce dehydration of the toxic baits, keep baits in their original container(s) and place inside plastic garbage bags during storage. Use the carry-over bait at first opportunity the following year. Bait that is dehydrated or moldy will not be attractive to prairie dogs.

Hazards to non-target animals. Toxic baits threaten animals through primary poisoning (i.e. direct consumption of the bait) and secondary poisoning (i.e. consumption of poisoned prairie dog carcasses by predators or scavengers).

The non-target animals most at risk from primary poisoning include domestic livestock and poultry and certain seed-eating birds, such as waterfowl, grouse, pheasants, and some songbirds. Though grain baits are altered by modifying the color and/or shape to make them less attractive to seed-eating birds, these modifications do not eliminate the risk. Alternate control methods may be necessary in areas where concentrations of non-target animals live and feed. It is advisable to remove livestock from treatment areas when possible,

even if the label does not require removal to prevent livestock from trampling bait. Always clean up and bury any spilled bait.

Secondary hazards from zinc phosphide are considered to be low. Zinc phosphide in the presence of digestive acids within the gut converts to phosphine gas, the actual poison agent. The phosphine gas dissipates from the carcass quickly after death leaving little residue to cause secondary poisoning.

Secondary hazards from anticoagulants varies by species but is considered significant. Research has discovered that scavenging birds and mammals are being poisoned by eating carcasses of rodents killed by anticoagulants. This secondary hazard is why labels of anticoagulant baits require post-application surveys to remove sick and dead prairie dogs from the landscape.

Disease

Plague, the bacterial infection that devastated Europe in the Middle Ages, is caused by a bacterium called *Yersenia pestis*. Typically, it spreads through the bites of infected fleas, but in extreme cases a form called pneumonic plague can spread via infected droplets from coughing. Incidents of plague occur sporadically amongst Montana's prairie dog towns, often resulting in dramatic declines in prairie dog numbers.

Some landowners may welcome plague as an easy way to control problem prairie dogs, but this attitude is short-sighted. Plague can, and does, spill over to humans, resulting in illness and sometimes death. While incidents of human infections have been rare in Montana, increased presence of plague can change those numbers quickly. In addition, plague is classified as a bioterrorism agent. Possession and transport of infected prairie dogs to new locales can result in severe criminal penalties (Title 18 U.S.C. Section 175, 178, 2332a).

MONITORING & FOLLOW UP

Complete eradication of a prairie dog colony is highly unlikely with an isolated application of a single control method. Experience has taught us that complete control can only be achieved

by repeating a control method for several years or by utilizing several control methods in a single year. For example, applicators can achieve complete elimination of a town by applying zinc phosphide bait for two or three consecutive years.

Even when high levels of control are achieved (i.e. 90 percent or higher) in a single application, prairie dog numbers can rebound due to immigration from nearby towns. Prairie dogs can travel several miles during their migration period which typically occurs in June to September. For this reason, landowners should monitor their properties for immigrating prairie dogs.

The takeaway is that landowners must adopt a multi-pronged and long-term approach to the management of prairie dogs. Expectations for rapid and easy success are unlikely to be fulfilled and will lead to inadequate control and discouragement.

DEPARTMENT SERVICES

As with most programs, rodent control will be most effective when all affected landowners work together. The Montana Department of Agriculture vertebrate pest specialist program will work with county commissioners, extension agents and landowners to establish a program suited to local and county needs. Field demonstrations are provided to inform landowners how, when and where to control prairie dogs and other field rodent pests. Interested individuals should contact the Montana Department of Agriculture.

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Additional printed information on the control of prairie dogs and other vertebrates is

available from the Montana Department of Agriculture website

<http://agr.mt.gov/Topics/Vertebrate-Pests>

**MONTANA POISON CONTROL
(Emergencies)
1-800-222-1222**

**MONTANA DEPARTMENT OF PUBLIC
HEALTH & HUMAN SERVICES
Injury Prevention Program
1-406-444-4126**

<http://dphhs.mt.gov/publichealth/EMSTS/prevention.aspx>

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WASTE PESTICIDE DISPOSAL PROGRAM

Do You Have Unwanted/Unused Waste Pesticides Such As:

- * contaminated pesticides
- * old products
- * canceled or suspended products
- * unknown pesticides
- * empty metal pesticide containers

**Remember to
Pre-Register!**



**No Penalties!
First 200lbs FREE!**



*One district per year

- * Four collection locations within that district
- * Collection sites in each district every third year

FOR MORE INFORMATION:

Contact: Montana Department of Agriculture at 406-444-5400 or Visit: <http://agr.mt.gov>