

Before it was settled, most of Kansas supported grasses that tended to restrict prairie dog populations. Proof of this taller growth can be seen in parks, cemeteries, railroad right-of-ways, road ditches, and rangelands where deferred grazing is common.

Originally, prairie dogs thrived only in places overgrazed by native animals. Populations expanded as European settlers arrived. As buffalo numbers dwindled due to overhunting and before the range was stocked with domestic livestock, prairie dog populations started to decline. Over the years, rangelands were fenced, ponds constructed, and large areas plowed. Remaining rangelands were overgrazed, and prairie dogs inhabited an estimated 2 million acres by the early 1900s. Prairie dog management programs and control laws were implemented, some of which remain in effect today.

Prairie dogs occupy an estimated 130,000 acres of rangeland in Kansas. This is about 1 percent of suitable habitat, leaving ample room for prairie dogs to increase in Kansas.

Since 1900, prairie dog populations have been reduced by increased cultivation of rangelands, organized control programs, and improved rangeland management. Kansas prairie dog populations have stabilized in recent years, but during drought numbers tend to increase.

## Description and distribution

Black-tailed prairie dogs are large burrowing ground squirrels found in the western two-thirds of Kansas. Weighing 1 to 3 pounds and measuring 14 to 17 inches long, prairie dogs have reddish-tan fur, large eyes, small ears, a broad head and a black tip on the end of a hairy tail. Five species exist in North America, but only the black-tailed prairie dog is found in Kansas.

## Biology and social organization

The black-tailed prairie dog is highly social and lives in colonies called prairie dog towns. Small groups generally composed of one adult male, three adult females, and six offspring display

territorial behavior toward adjacent groups in the town.

Prairie dogs live in burrows approximately 10 yards apart, 3 to 14 feet deep, and 10 to 100 feet long or more. A crater-like mound, 3 to 10 feet across and a foot or more tall at the entrance to the burrow prevents water from rushing in and serves as a lookout station. A density of 35 burrows per acre is common, although up to 100 burrows per acre have been reported. Most burrow systems have one entrance, although some have two or even three entrances.

Prairie dogs are active during the day. They are not true hibernators but may stay below ground for several days during cloudy and cold winter weather.

Prairie dogs produce one litter of three to eight young per year born from March to April after 28 to 34 days gestation. Only about three or four survive to come above ground. The young may venture above ground at 5 to 6 weeks of age, usually by early May.

Prairie dog densities vary from about 5 per acre in late winter to 20 per acre after the birth of young in spring. But spring densities of up to 35 per acre have been reported.

Dispersal usually occurs in late spring. Prairie dogs can increase the area they occupy by 50 percent per year. Animals may disperse up to 3 miles and eat the same forage as livestock. This is why landowners want to manage populations.

## Economic importance

Prairie dogs and their burrows serve as important hosts for numerous animals. Eighty-nine vertebrate species were found associated with prairie dog towns in Oklahoma. The prairie dog serves as an important food source for predators including endangered black-footed ferrets, badgers, coyotes, foxes, eagles, prairie falcons, hawks, owls, and possibly bobcats, mink, and long-tailed weasels. Burrows provide homes for burrowing owls, cottontail rabbits, rattlesnakes, and other animals. Prairie dogs offer recreation for photographers, hunters, and nature observers.



Prairie dog burrowing decreases soil compaction, increases water intake, aerates the soil, and promotes soil formation. On a typical town with 25 mounds per acre, the amount of soil exposed on the mound and adjacent areas is less than 3 percent of the total area. This denudation does not normally cause severe soil erosion.

## Health risks

Plague is a health risk for individuals involved in prairie dog management programs. Although a few cases of human plague occur in the western United States each year, there have not been any recent cases of humans contracting plague in Kansas.

Plague is transmitted to humans through bites of fleas that inhabit wild rodents infected with plague. Most human plague cases are related to direct contact with wild rodents. Early symptoms include swollen and tender lymph nodes, chills, and fever. Early diagnosis and treatment are imperative. When walking through suspected plague areas, apply an insect repellent to socks and pant cuffs before tucking pants inside boots.

## Effects on range

Prairie dogs modify rangeland to meet conditions that favor survival. They feed on many of the same grasses and forbs that are important to livestock. Most plants eaten by livestock also may be eaten by prairie dogs. Annual dietary overlap has been estimated at 64 to 90 percent.

Prairie dog clipping selectively influences the abundance of various plants in an area. The effect on rangeland forage and livestock production depends on geographic location, rainfall, dominant grass species, and other factors. A variety of effects on rangeland vegetation have been reported: from no obvious effects to a 20- to 40-percent reduction in forage availability, to increasing the percent of grass species preferred by livestock.

Prairie dogs may improve forage. Plants clipped by prairie dogs stay in a “younger” stage of maturity, which is more palatable and digestible to cattle. Younger plants often have a higher crude protein level, which increases nutrient value.

In times of drought when less forage is available, competition from prairie dogs is more noticeable. The 2002 and 2003 droughts illustrated the rangeland devastation that can result from too many grazers (either prairie dogs or cattle) and too little rainfall. Higher quality vegetation does not benefit cattle producers if there is not enough vegetation for cattle to eat. Bare ground is more evident because forage is shorter and more widely spaced. As a result, prairie dogs affect more acres. Although numbers may not increase, prairie dogs spread out to find forage and appear more numerous.

### **Black-footed ferrets**

The black-footed ferret (above) is an endangered species that feeds on prairie dogs. It is illegal to kill them. These animals are seldom observed because they usually are found in low densities and are primarily active at night. Black-footed ferrets have been scarce since the first one was discovered in 1851. They are thought to be extinct in Kansas, and the U.S. Fish and Wildlife Service does not require ferret searches before colony treatment in Kansas.

### **Control methods**

Methods for reducing prairie dog populations or preventing increases include deferred grazing, shooting, poison baits, and burrow fumigants. Techniques such as providing predator attractants or hiding places, using visual barriers or live trapping have not been effective in reducing prairie dog numbers. Use of vacuum devices or



*Black-footed ferrets.*

gas exploding equipment for destroying burrows are not legal in Kansas. Such practices have not been effective in other states.

### **Deferred grazing**

Research in Barber County, Kansas, has shown that prairie dog numbers can be reduced in mid-grass prairies by restricting grazing to September through April, which increases grass height. Deferred grazing on the short grass prairies of extreme western Kansas has not been shown to decrease prairie dog numbers. Short duration or cell grazing instead of season-long grazing, may allow enough time for vegetation to grow tall enough to deter prairie dogs. Prairie dog control should include proper livestock stocking rates and other range management practices to prevent overgrazed conditions that serve as prime habitat for prairie dogs.

### **Shooting**

Intensive rifle shooting during the breeding season (February) has been shown to disrupt prairie dog reproductive activities and prevent colonies from spreading. It is not likely that shooting prairie dogs will ever be considered a successful eradication technique. Yet several landowners are able derive income from prairie dogs by leasing the opportunity for sportsmen to shoot prairie dogs on their land, which may offset forage loss due to prairie dogs.

### **Toxicants**

Toxicants that are legal for prairie dog control in Kansas are grouped under two general categories: poison grain or pellet baits and fumigants. These toxicants should be used with caution because poison baits may kill a variety of birds and mammals, and fumigation kills all wildlife found in the burrows. Only toxicants labeled for prairie dog control are legal for that purpose. Read and follow all label directions.

### **Poison grain baits**

Controlling prairie dogs with poison grain bait is most effective during clear, settled weather (rain washes the toxicant from some baits) and is only effective when the most desirable food (green grass and forbs) has become dried and dormant. Fall baiting is successful because prairie dogs are actively eating grass seeds to build up fat reserves for winter. Two active ingredients in grain baits and pellets are registered for Kansas: zinc phosphide and chlorophacinone. Label requirements vary depending on the product used.

### **Zinc Phosphide**

When using zinc phosphide grain or pellet baits, prebait with untreated oats (preferably steam-rolled oats) one to two days before baiting. Prebaiting is essential for the following reasons:

1. It increases the acceptance of treated bait, which results in significantly better control.



2. It gives more predictable results than without prebaiting.
3. It is required by the label.

Apply prebait and bait on the edge of each mound where the bare soil and grass meet – do not place on the top of the mound or down in the burrow. Zinc phosphide is a relatively slow-acting toxicant that can be absorbed in small amounts through human skin. These poison baits are restricted-use pesticides, which require the applicator to obtain private or commercial certification from the Kansas Department of Agriculture.

Application rate should not exceed 1 heaping teaspoon (4 grams) per burrow when using 2 percent zinc phosphide oats or ZP Rodent Bait AG. For a typical town, about 1/3 pound of zinc phosphide bait per acre is required. Application of excess bait will not improve control but will increase the risk to non-target animals. Zinc phosphide baits are extremely hazardous to birds.

Do not apply zinc phosphide poison baits more than once per season because prairie dogs surviving the first treatment usually become bait-shy. Do not breathe zinc phosphide dust or fumes, and avoid contact with skin. Wear rubber gloves. Because zinc phosphide is poisonous to all animals, it should be stored away from humans or pets. Apply treated bait only after all or most of the prebait has been eaten and only to burrows where the untreated bait was consumed, usually two days after prebaiting. Zinc phosphide application is restricted to July 1 through December 31.

### Chlorophacinone

Different label requirements apply if using Rozol® Prairie Dog Bait (24-C label), which contains the active ingredient chlorophacinone. Apply 1/4 cup (53 grams) of this product at least 6 inches down in the burrow.

This bait must not be applied above ground. Apply bait to active burrows and use Rozol® only between October 1 and March 15. Prebaiting is not necessary. Rozol® Prairie Dog Bait is not a restricted-use pesticide. It is an anticoagulant bait, and small mammals will begin to die four to five days after consuming a lethal dose.

Because the bait is applied in the burrow, there is little risk of birds

consuming this product. If excessive prairie dog activity exists after 30 days, apply a second time following the same directions. Follow label instructions when using any pesticide.

Collect and properly dispose of any dead animals found above ground. Some secondary hazards have been documented in predators and scavengers that have fed on animals killed with chlorophacinone.

When applied according to label directions and the above recommendations, poison grain baits may reduce prairie dog numbers by about 90 percent. The presence of green grass, lack of prebaiting, poor weather conditions or moisture may hinder control. If better control is needed, follow poison bait with a fumigant.

### Fumigants

Fumigants legal for prairie dog control in Kansas include gas cartridges and aluminum or magnesium phosphide. Aluminum or magnesium phosphide emits a poisonous gas, while gas cartridges produce a suffocating gas made of carbon monoxide. Fumigants should be used only as a follow-up to poison grain baits because fumigants are expensive, difficult to apply and pose an extreme hazard to the black-footed ferret and other desirable wild-life species that occupy the burrows. A permit from the Kansas Department of Wildlife and Parks is required to use any burrow fumigant, and only those certified to use restricted-use pesticides can legally apply aluminum phosphide. Fumigation permit applications are available from the local K-State Research and Extension office.

Fumigants are most effective when soil moisture is good. It is only necessary to treat active mounds, and fumigation usually follows a baiting program when eradication is the goal. To identify active mounds, shovel, blade or place a dry “cow chip” over all holes three or four days before treatment. Treat only the holes that have been reopened by the prairie dogs. This procedure will greatly reduce the amount of fumigant needed.

Apply aluminum or magnesium phosphide and gas cartridges in the following manner:

1. Place two tablets or 10 pellets of aluminum or magnesium phosphide

as far down into the burrow as possible. Do not touch the tablets. Wear rubber gloves.

2. Using a nail or ice pick, punch five or six holes in one end of the gas cartridge. Insert the nail part way and rotate it to loosen the contents, allowing the cartridge to burn more rapidly. After the fuse is inserted, lit and burning well, gently roll the cartridge as far down as possible.
3. After placing fumigant into the burrow, immediately plug the opening with a plug of sod placed grass side down or a sheet of newspaper. Then cover the burrow with loose soil to form an airtight seal. Do not breathe fumes. Take care not to cover and smother the fumigant. As a general rule, fumigants will not give satisfactory control if the soil is dry.
4. Do not use aluminum or magnesium phosphide until the soil temperature is greater than 45°F because it forms a gas too slowly to prevent prairie dogs from digging out.

Avoid using fumigants in burrows that are occupied by burrowing owls, which can be identified by the presence of white droppings, pellets and feathers around the burrow opening.

Simply exterminating the prairie dog population will not return the range to good productive condition. Additional steps should be taken to rehabilitate evacuated dog towns. The mounds should be leveled with a land plane, blade or an offset disc set just above the ground surface to help the area of mounds revegetate faster. To allow the grass and root system to recover, it is beneficial to exclude livestock from the prairie dog town with an electric fence, defer grazing for at least one growing season, and possibly reseed the area with native grasses. By continuing good grazing management practices, the rancher can return the range area to a high level of productivity and make it difficult for other prairie dogs to become established.

Prairie dogs play an important role in the prairie ecosystem by creating unique islands of habitat in the wide expanses of the prairies. These habitats increase plant and animal diversity. Without these habitats, recreational opportunities for nature observers, photographers and the sporting public would be diminished. Most folks,

ranchers and wildlife enthusiasts alike, want healthy rangelands now and for the future.

**Assumptions used to calculate costs**

Labor = \$10/hour

ZP oats = \$1.35/lb

Prebait oats = \$0.30/lb

Rozol = \$2/lb

Can treat 7 acres/hour when density is 10 burrows per acre

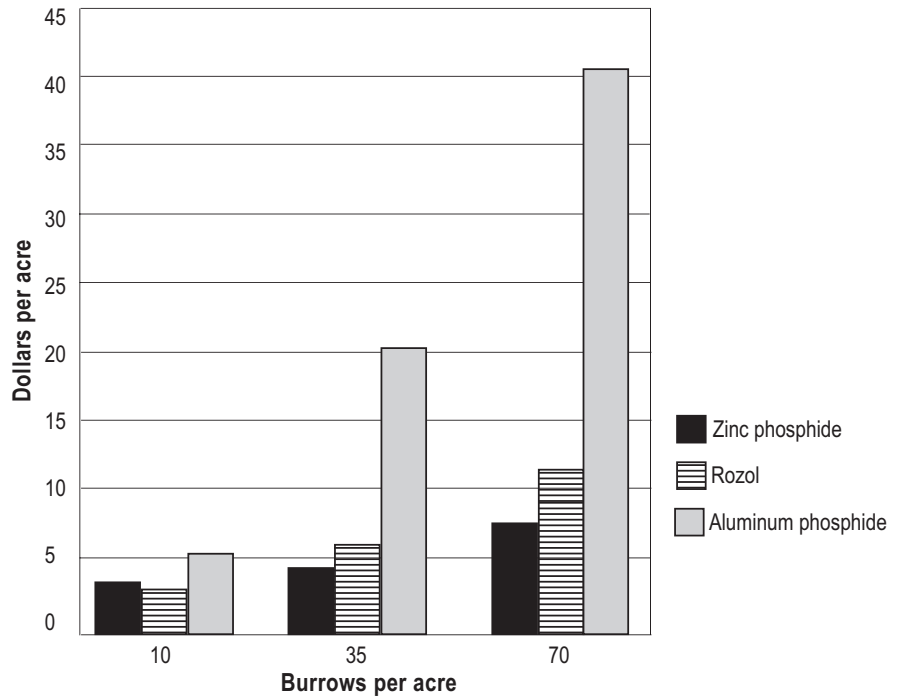
Can treat 5 acres/hour when density is 35 burrows per acre

Can treat 3 acres/hour when density is 70 burrows per acre

Can fumigate 25 burrows per hour

Phostoxin = \$0.06/tablet. Use three tablets per burrow

**Estimated prairie dog control costs (2005)**



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Brand names appearing in this publication are for product identification purposes only. No endorsement is intended, nor is criticism implied of similar products not mentioned.

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