Bulletin No. 12 - Ground Squirrels (Gophers)

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UNIVERSITY OF WYOMING.
Agricultural College Department.

WYOMING EXPERIMENT STATION,
LARAMIE, WYOMING.

BULLETIN NO. 12.
APRIL, 1893.

GROUND SQUIRRELS
(GOPHERS.)

BY THE ENTOMOLGIST.

Bulletins will be sent free upon request. Address: Director Experiment Station, Laramie, Wyo.
Wyoming Agricultural Experiment Station.

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GROUND SQUIRRELS.

F. J. NISWANDÉR.

Many are the pests which harass the farmer and destroy his crops. The damage done is often considerable. Many ranchmen and gardeners complain of the damage done by ground squirrels or "gophers" as they are commonly called. During the past season these complaints have been numerous; and all unite in saying that nearly everything is eaten by these pests. The majority of the Experiment Farms were overrun with these rodents during the summer of 1892. Many of the most promising experiments were entirely destroyed.

On the Laramie Experiment Farm the acre plat containing several varieties of barley, (Fig. 1), was so badly injured that, in some instances, the yield was less than the amount of seed sown. The plats containing the different varieties of oats were also badly damaged. Our acre plat was not harvested owing to the ravages of these squirrels. Of several varieties harvested only enough seed was obtained to repeat the experiment during the present season.

Mr. J. S. Meyer, superintendent of the Experiment Farm, at Lander, Wyoming, says: "We are bothered a great deal with 'gohers'. They are death on carrots and alfalfa." His letter further states that they do damage the entire season, from March until September, and that he considers a practical method of destroying them of great
importance to ranchmen and those engaged in growing garden vegetables.

Mr. J. D. Parker, superintendent of the Experiment Farm, at Saratoga, this state, writes concerning these squirrels that "They dug up nearly all of our first planting of corn and injured, to a considerable extent, cucumbers, pumpkins, squashes, melons and cabbage plants. After the crop was up they injured oats, wheat, rye and barley." Mr. Parker sends the name of several ranchmen who have complained of the damage done during the season of '91 and '92. He further states that "a ranchman near his place had his seed potatoes entirely destroyed. The young potatoes were also eaten and destroyed." It seems as though the damage done is so great that any means which will in any way destroy the gophers, however expensive it may be, would be considered a boon to ranchmen."

Mr. Jas. A. Becker, superintendent of the Experiment Farm, at Sheridan, Wyoming, states that the prairie squirrels are not very numerous, but that the pocket gopher is more common and does the most damage, and that they have injured several gardens in that vicinity.

Martin R. Johnston, superintendent of the Experiment Farm, at Wheatland, Wyoming, says: "We had considerable trouble with 'gophers.' They dug up the seeds, particularly melons, cucumbers, pumpkins, peanuts and corn. They begin work on the seeds as soon as planted, but do the greatest damage after the plants have commenced to grow and are through the ground."

"This squirrel injures the farmer by taking up newly planted corn as does the striped squirrel. * * * It frequently burrows during summer in grain fields, where
Fig. 1. Acre of barley injured by "gophers." Laramie Experiment Farm.
it eats the green plants, and afterwards the heads of grain as the kernels fill; and in this manner, and by throwing down the standing grain, spoils it for some distance around the burrows.*

Many others in this state have added their testimony to the injury done by these pests, especially to sugar beets and other root crops. The destroying of crops is not the only damage done. Holes are dug in the ground which are often so numerous and close together that they are a great inconvenience, especially on the irrigated farm. The "gophers" in their habits are similar to the prairie dogs of Kansas and Nebraska, their burrows being close together, forming villages or towns.

Our most common species is *Spermophilus franklinii*, Sabine, or the gray prairie squirrel. The following description will enable one to identify the species: "Length about ten inches from the nose to root of the tail; the tail about five inches long. It is a little over three-fourths the size of the migratory or common gray or black squirrel, though its short hair, tail and legs make it appear smaller; and its form is much thicker and clumsier than that of the true squirrels. The back is light brown, dotted thickly with black; the under surface is grayish white. The tail is bushy, but much less so, as well as much shorter, than that of the migratory species.*

Figs. 3-4† The color and markings often vary. The color above is often light yellowish brown, varied with black. The top and sides of the head and the sides of the neck pure hoary gray. It resembles in it its propor-

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‡These are not figures of the species described, but resemble it closely in form, size and markings.
tions the prairie dog, *Scirurus ludovicianus*—Custis—the only difference being in the size and colorings. The hairs around the margin of the tail are grayish white, each hair having three bars of black. This species, *Spermophilus franklinii*, is recorded as being found in Wisconsin, Illinois, Missouri, Iowa, Minnesota and Kansas. It is not so abundant in these states as in Wyoming, neither is the damage done by it in these states so extensive as in Wyoming. The Laramie Plains are overrun with these squirrels; being met with on every hand. It seems as though this section is especially adapted to their conditions, although they are more or less numerous throughout the entire state. They are fond of digging burrows and sit at the mouth of these burrows on warm pleasant days, barking at the passerby. Away from the traveled roads they are not shy, but near well traveled roads they seek their burrows upon the least alarm. They are quite difficult to secure when shot, as their death struggles are always directed toward pushing themselves further into their burrows. They are usually gregarious, living in colonies or small villages, the openings of their burrows being on the top of a gravelly knoll, they burrow within a few feet of each other. Several pairs often entering the same hole.

In this portion of the state they usually make their appearance as soon as the frost is out of the ground. I have even seen them at the mouth of their burrows while the ground was yet frozen. The average time of appearing is about the middle of March. From this time until the middle of August, or until the first of September, they wage destruction against growing crops. They do most of their damage during the hottest portions of the day.
They usually go into winter quarters about September 1st, although but few specimens were seen in 1892 after August 20. During the summer the grain and seeds are stored for winter use. (The word *Spermophile*, meaning seed lover.) The mouth of the burrow is plugged with earth in order to keep out the winter frost.

The methods of destroying these pests are numerous. Many drown them out of their burrows and then kill them. This is a long and tedious method. I have seen water running from an irrigating ditch into one of the burrows for half a day, and it seemed as though another half-day would have been insufficient to have filled the burrow. Then again, in this region, water is often difficult to obtain. It would in many instances have to be drawn in barrels or tanks for perhaps a half-mile, or further.

Many ranchmen and gardeners use strychnine, rough on rats, arsenic and other poisonous substances. Usually corn or some kind of grain is soaked in a solution of one of these poisons and is then placed near their burrows. This method has in some instances been satisfactory. There is this danger arising from the practice of such a
Ground Squirrels.

method: Stock, poultry and the wild birds are as liable to get the grain as are the squirrels.

During the summer of 1892, a number of experiments, having in view the destruction of these squirrels, was carried on upon the Laramie Experiment Farm. For this purpose a quantity of bi-sulphide of carbon was used. This liquid is highly inflammable and should NEVER be brought near fire, for fear of an explosion. It is not poisonous or corrosive to the skin, and may be handled with impunity. Avoid breathing it; the vapor is unwholesome. The only danger is when brought in the presence of fire—a lighted pipe, cigar or match would in all probability cause an explosion. Bi-sulphide of carbon should be kept from children and irresponsible persons, as they are liable to drink it, and the consequences might be serious. The unpleasant odor is easily and readily detected and by observing the proper precaution, no danger need be feared. The method of applying is to take a ball of cotton, about

Fig. 3. Spermophilus grammarius.—Baird. (Rock Ground Squirrel.)
the size of an egg, and thoroughly saturate it with the bi-sulphide of carbon. One farmer, in Nebraska, in writing about the method of applying it, says that he uses the dried balls of horse manure and finds that they do equally well and are of less expense, and can be easily obtained. He finds that they readily absorb the bi-sulphide of carbon. With a rolling motion throw the cotton into the burrow and close the opening with some earth. The operation is simple and the result certain. The bi-sulphide of carbon evaporates rapidly, and being heavier than air, soon fills the burrow and smothers or overcomes the squirrels.

The application should be made in the evening, at sun-down, as the squirrels are in their burrows at this time and the material will not be wasted. A pint of this liquid will be sufficient to treat twenty burrows.

On the Laramie Experiment Farm ninety-six burrows were treated during the month of July. The applications were, with few exceptions, made in the evening. The next day the treated burrows were visited, and in no instance had the earth which had been used for plugging the opening been disturbed. A second and third visit to these burrows found them securely plugged. In two instances some animal, presumably a ground squirrel, had made an effort to dig open the burrow from the outside. The opening extended only to the ball of cotton, when, from all appearances, the task was given up. In forty-three instances "gophers" (squirrels) were driven or seen going into the burrows. These were treated at once, and fortunately none were opened. It is safe to conclude that none of them returned to the surface.

It may be that others would not have the success
that attended these experiments, although it is no more than fair to presume that with the exercise of carefulness and thoroughness everyone ought to be attended with the same success.

Bi-sulphide of carbon has been used with marked success against prairie dogs in Nebraska and Kansas. The following letters are published as bearing on this statement:

OXFORD, Neb., May 13, 1889.

MR. EDWARD TAYLOR—

My Dear Sir: I am in receipt of your note, received some time ago, respecting your extermination of prairie dogs through bi-sulphide of carbon, and, in reply, must say that it did fulfill all you claim for it. I think it is the best and cheapest means by which the great pests can be destroyed without going to the great expense of breaking up the ground and hiring men to shoot them. I cleared a pasture of eighty acres with fifty pounds, and not a dog showed up all summer. Five or six came from another town, one mile off, late in the fall, but I soon put them to sleep, and they have not waked up yet. I have recommended it to many. They all are satisfied that it is the cheapest means by which prairie dogs can be destroyed.

THOS. SHEFFRAY.

—Prairie Farmer, May 25, 1889.

EDITOR JOURNAL, COLUMBUS, NEB.—

Dear Sir: It was my fortune in purchasing land here in Platte county to have a few prairie dogs thrown in, as a nuisance, and it has ever since been my wish to get rid of them. I tried various kinds of poison, shooting, drowning, etc., but all failed until quite recently I learned that bi-sulphide of carbon would destroy them. It is a liquid; can be purchased at the drug stores at a cost of from ten to fifteen cents a pound by the quantity. I bought from three different parties. The best and
cheapest I got from Edward R. Taylor, of Cleveland, Ohio. It is sure death to prairie dogs, gophers, squirrels, etc. Mode of applying it: Take a piece of cotton the size of a hen egg, saturate it with about one-half an ounce of the bi-sulphide of carbon, throw it into the hole of the animal, cover the top of the hole with ground, so that the cotton is lose in the hole. A gas is formed and the dogs are killed. I have destroyed my dogs on about eighty acres at a cost of $30.00, and increased the value of the land $500.00. One pound will do for twenty-five holes. This medicine is quickly applied and is sure death. No humbug about it.

Very respectfully thy friend,

ISAIAH LIGHTNER,
Matson, Platte County, Neb.

The following letter was published in the Prairie Farmer of September 21st, 1889, which goes to prove the value of this substance as a specific against burrowing animals:

CRAWFORD, Rice County, Kans.,

JULY 8, 1889.

EDWARD R. TAYLOR, Cleveland, Ohio—

Dear Sir: I received your communication some time ago in regard to bi-sulphide of carbon shipped me. Yes, I received it all right, and it worked like a charm. We killed the prairie dogs on about a hundred acres with the five gallons received. I don’t think there is any other remedy anything like equal to bi-sulphide of carbon for killing prairie dogs, and I would advise anyone having them on their land to to use the same for killing them, for it is the best, as well as the cheapest, way of getting rid of them.

Bi-sulphide of carbon is equally as good for rats and ants, in fact all predatory animals of every kind living in the ground, as it is for the ground squirrels and prairie
Ground Squirrels.

dogs. It is used to destroy all kinds of vermin which inhabit flouring mills, grain elevators or granaries; in fact, all buildings used as store houses and infested with vermin are quickly and easily renovated.

There are two grades manufactured. One known as Fuma and the other as Commercial. I should earnestly recommend the Fuma as being the better for the ground squirrels. It is sold by the manufacturer, Edward R. Taylor, Cleveland, Ohio, at ten cents per pound, F. O. B. the cars at the factory. A gallon weighs about ten pounds and is sufficient to treat 160 to 200 burrows.

The experiments of '92 will be repeated the coming season. To those who are troubled with "gophers" I would like to urge upon them the importance of this remedy, as I feel that they will be amply repaid if given a thorough trial. (See note on last page.)
[Note.—The Entomologist of the Wyoming Agricultural Experiment Station will be pleased to receive insects from the residents of the State, and will endeavor to answer any inquiries concerning their life history or the best means of destroying them if injurious. Insects can be sent by mail for one cent per ounce. If the specimens are dead they should be packed in cotton or wool to insure safe transportation, and enclosed in a tight wooden or tin box. Never send insects in a letter, as they will be crushed beyond recognition. Whenever it is possible live insects should be sent. Caterpillars, grubs, maggots, etc., should be supplied with enough of their food plant to last them until they have reached their destination. It is unnecessary to cut air holes in the boxes, as the amount of air required by insects is very small. When sending insects the name of the sender should be written on the package. Anyone sending specimens for identification will confer a favor by giving as full particulars as possible concerning their habits; for example, what plant it infests; whether it infests the roots, stems, twigs, buds or leaves; how long you have known it to be injurious, and what amount of damage it has done. It is also desired that anyone who has crops injured by gophers or squirrels during the season of '93 will report the amount of damage done, as well as their method for destroying these pests to the Experiment Station. All packages and communications should be addressed to F. J. Niswander, Agricultural Experiment Station, Laramie, Wyo.]