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THE COLUMBIAN GROUND SQUIRREL
ITS BIOLOGY AND CONTROL



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THE COLUMBIAN GROUND SQUIRREL:
ITS BIOLOGY AND CONTROL

Written by:
Ray Record*
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BIOLOGY:

The Columbian ground squirrel (Spermophilus columbianus) is the large ground squirrel found in Montana from the east slope of the Continental Divide westward. It is easily distinguished from other Montana ground squirrels by its larger size and distinctive coloration. An average adult weighs more than a pound. Its head and body measure 10 to 12 inches in length, with a 3 to 5 inch tail. Reddish-brown fur is found on the nose, forelegs, and hindquarters.

Columbian ground squirrels hibernate for six to seven months each year. Their active period varies with local conditions, but in most areas they are active between March and August. The males come out of hibernation about two weeks before the females. They breed shortly after the females emerge. One male may breed more than one female, and two to seven young per litter are born during mid-spring, usually May. Contrary to popular belief, Columbian ground squirrels have only one litter per year.

Ground squirrels eat a wide variety of food. This species seems to concentrate on succulent green forage during the first portion of their active period. Dry food such as seeds is eaten as it becomes available later in their active period, but green food is a major constituent of their diet even then. This preference for green food sometimes makes it difficult to reduce Columbian ground squirrel damage with toxic grain baits.

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CONTROL:

Where high populations of ground squirrels exist, they may pose a serious pest problem by competing with livestock for range forage, destroying food crops, and serving as a potential disease reservoir. It is, therefore, sometimes desirable to manage local populations to reduce economic damage or potential human health hazards.

A. SHOOTING

Shooting with a .22 caliber or high-powered rifle may provide some relief from ground squirrel depredation in situations where very small squirrel colonies are under constant shooting pressure. It is, however, an expensive and time-consuming practice.

B. TRAPPING

Traps are best suited for removal of small local populations of ground squirrels where other control methods are unsatisfactory or undesirable. Properly maintained traps are quite selective.

Both spring traps (No. 1 or No. 0) and box traps may be used. Spring traps should be placed where squirrels will travel over them entering and leaving the burrow. Conceal the trap by placing it in a shallow excavation and covering it with 1/8 to 1/4 inch of soil. Be certain that there is no soil or small pebbles beneath the trap pan to impede its action. No bait is necessary.

Box traps may be set in any areas frequented by ground squirrels. Place them solidly on the ground so that they will not tip or rock when the squirrel enters. Cover the floor of the trap with dirt and bait it with fresh fruit, vegetables, greens, peanut butter or grain. Experiment to find the best bait or combination of baits

for your area and time of year. Wiring the door of the trap open for several days while replenishing the bait daily helps overcome the squirrel's trap shyness and increases trapping success.

C. FLOODING

Flooding of individual burrows is not practical due to the size and complexity of burrow systems. Flood irrigation does, however, seem to limit the number of ground squirrels present.

D. TOXIC GASSES

Toxic gasses may be used to control ground squirrels in some situations. At the present time the gas cartridge is the only toxic gas registered in Montana, although others may become available in the future.

Gasses are best suited to small acreages or light squirrel infestations because of the comparatively great amount of labor required. The burrow system of the Columbian ground squirrel is often quite complex, with several openings and numerous interconnecting tunnels. This sometimes makes gassing difficult.

If toxic gasses are used, be sure that all burrow entrances are sealed tight with tamped earth. Gasses work most effectively when soil moisture is sufficiently high to prevent gas from seeping into the earth.

E. TOXIC GRAIN BAITS

Presently, direct population reduction with toxic grain bait is the most practical method of ground squirrel control for most situations. The Columbian ground squirrel, however, is one of the most difficult species to control with toxic grain bait. Its apparent preference for green foods and suspiciousness of unnatural

food sources often leads to poor acceptance of grain baits. There are several things that should be done to optimize chances of success in control operations:

1. BE SURE THAT THE ENTIRE POPULATION IS ACTIVE

If a portion of the population is in hibernation, it does little good to apply bait. (See Figure 1.) Baiting should never be done at the first sign of activity in the spring, or when the squirrels start to disappear into their burrows late in summer. A third period when baiting should be curtailed is late in the gestation period and shortly after the young are born when females are relatively inactive above ground. This period varies locally, but it generally begins four to eight weeks after emergence from hibernation. The activity level of the females can be checked by simply shooting a number of squirrels (at least 10) and checking the ratio of males to females. If it is approximately 1:1, the females are probably active and baiting is appropriate if other factors are satisfied.

2. BE SURE THAT GROUND SQUIRRELS ARE READILY ACCEPTING GRAIN

Columbian ground squirrel feeding habits vary with the time of year. (See Figure 1.) It is important to test the acceptance of clean (untreated) grain prior to the use of toxic grain. Do this by scattering a tablespoonful of grain by each of several active burrows. If it is not eaten, toxic grain would not be eaten at that time either.

Figure 1 illustrates some general guidelines for Columbian ground squirrel bait acceptance. Note that bait acceptance in early spring is poor; apparently because of the squirrel's preference for succulent green forage at that time. Field tests conducted

during the 1930's and 1940's showed that early baiting yielded very poor control. This is unfortunate, because early control would be desirable to prevent spring crop damage and reduce the number of litters being born that year.

The question of when to bait Columbian ground squirrels is very complex, and there are presently no "hard and fast" answers. Each person must determine the precise timing for his own area by observation of ground squirrel activity and testing of bait acceptance by the method described above.

3. USE FRESH GRAIN BAIT

Bait that is more than a few months old should not be used. The potency of most baits does not diminish significantly, but the palatability to ground squirrels does. This leads to poor bait acceptance.

4. BAIT SHOULD BE USED ONLY ONCE PER YEAR

If baiting is unsuccessful once during a year, re-baiting will only compound the problem. The squirrels surviving the original baiting operation probably ate some of the bait and became ill. These squirrels will be much more shy of the bait the second time. For this reason, it is important to do a good job the first time bait is applied.

5. PLACE THE BAIT PROPERLY

Proper placement of bait is critical to successful control. The amount of bait specified on the label should be scattered, not piled, adjacent to each active burrow. It should not be placed in the burrow because squirrels are highly suspicious of food there. They are more accustomed to foraging above ground

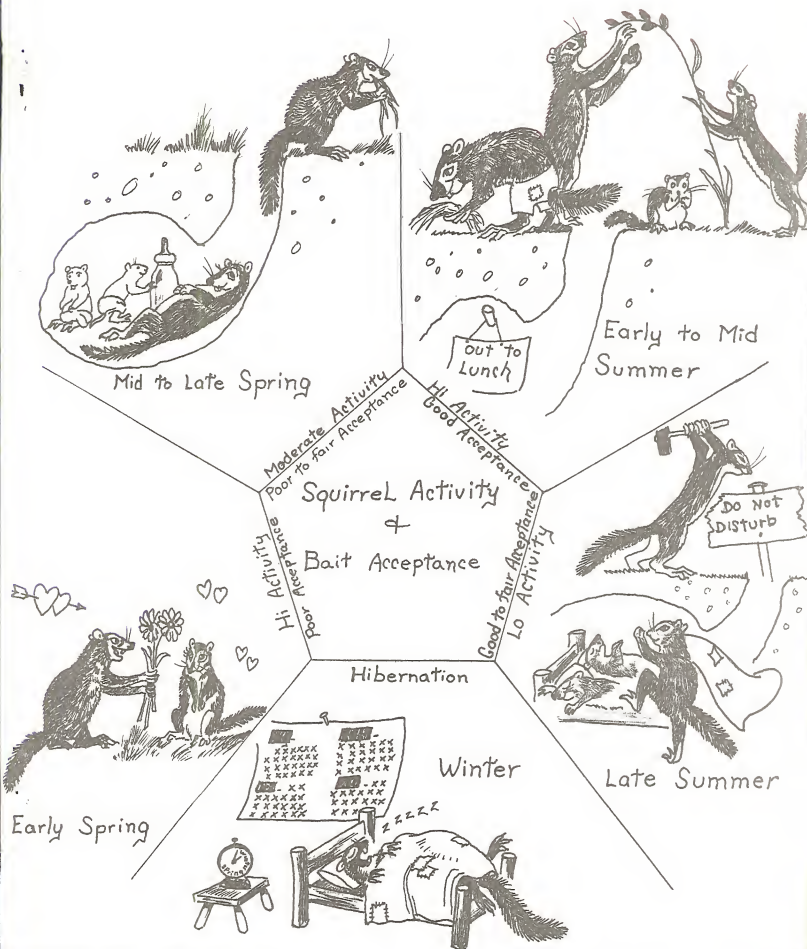
for their food. All active burrows must be baited. Incomplete coverage of a squirrel colony will result in poor control success.

6. PREBAITING MAY INCREASE BAIT ACCEPTANCE

Prebaiting means exposing untreated grain to the squirrels several days before using toxic grain. This accustoms the squirrels to eating this new food source and enhances the chance of them eating a lethal dose of toxic grain before becoming ill and ceasing their feeding. Prebaiting may improve bait acceptance, and therefore, control. The major disadvantages are increased cost and labor.

If you have questions regarding the Columbian ground squirrel and its control, contact the Montana Department of Livestock, Vertebrate Pest Control Bureau, Helena, Montana, 59601, or call 449-2045.

Figure 1. Squirrel activity and bait acceptance.



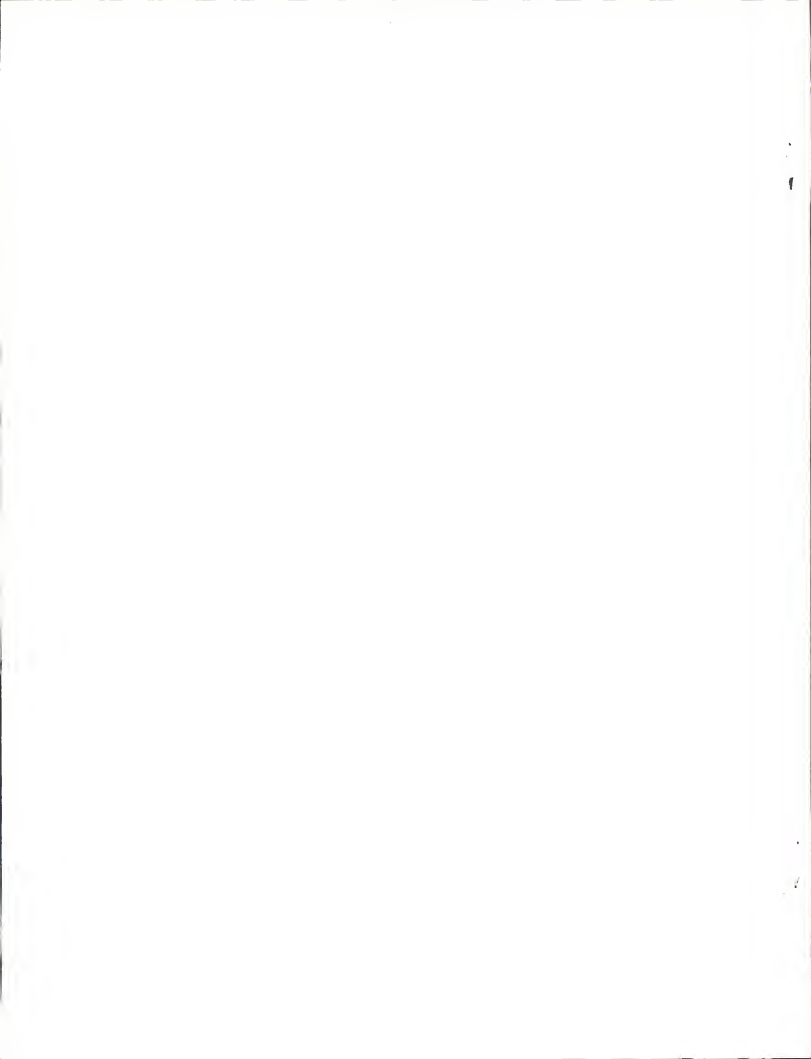
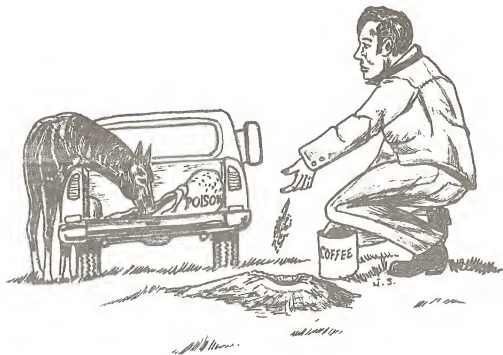


Figure 2. How many things is this man doing wrong?

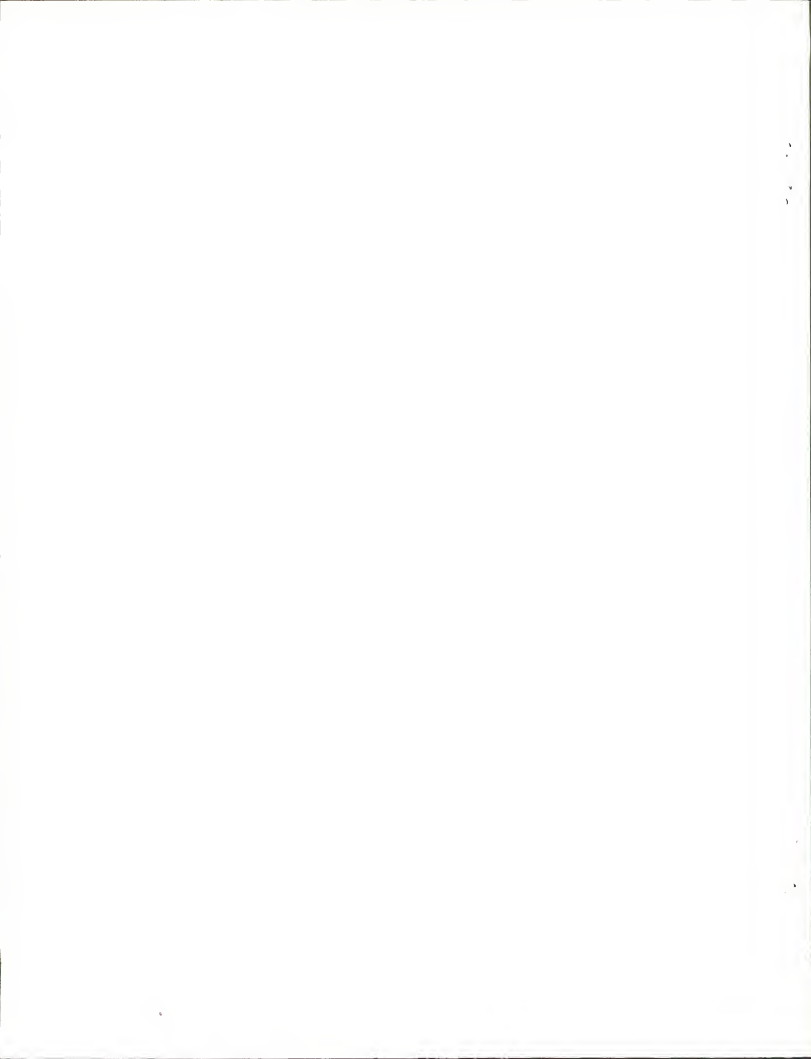


1. Left open bait bag in pickup.
2. Carrying bait in open can with improper labeling.
3. Not wearing gloves.
4. Not using bait dipper.
5. Throwing bait down the hole.

Figure 3. Correct and safe baiting practices.



1. Bait kept in locked box in pickup marked POISON.
2. Bait carried in zippered canvas bag marked POISON.
3. Applicator wearing gloves.
4. Applicator using calibrated bait dipper.
5. Applicator is scattering bait by each hole, not piling it or throwing it down the hole.



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2
3

4
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6

