Use & Calibration of the Cyclone Seeder for Control of Richardson's Ground Squirrels on Rangeland, Pasture, & Cropland

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ALWAYS FOLLOW THE PESTICIDE LABEL. Read and understand the label BEFORE purchasing and using a pesticide. The following information is to assist in the proper use of zinc phosphide-based rodenticides for ground squirrels. But in no part does this document overrule the pesticide label. If you have questions, call the pesticide manufacturer, listed on the label, or the Montana Department of Agriculture, listed at the end of this document.

Cyclone Seeder Calibration

To calibrate the cyclone seeder for Richardson ground squirrel control utilizing zinc phosphide grain bait, you will need the following equipment and materials:

- cyclone seeder (electric fan model)
- wood or metal frame with inside measurement of one square foot
- scale (20 lbs or greater capacity)
- 5-gallon bucket or plastic tub ν measuring tape ν untreated oats (20 to 30 lbs - preferably same as the grain used for the zinc phosphide oat bait
- zinc phosphide treated oats registered for Richardson ground squirrel control in the site where the ground squirrels are causing damage and allowed for broadcast use.

First, securely mount the cyclone seeder onto your vehicle, ATV, or tractor. Once secure, determine what vehicle speed you wish to maintain while applying bait. For most terrains, five miles per hour has been satisfactory. You may want a hand throttle to maintain a steady speed. A variation of only one mile per hour in speed will increase or decrease the application rate by 20 percent. Throughout the remainder of the calibration, be sure to use the same vehicle speed. Recalibration will be necessary if you choose to change to other speeds.

Using a small amount of untreated oats (5 lbs), adjust the fan speed while driving at the selected speed to get a baited swath of approximately 20 feet (may be larger for larger broadcasting spreaders). This should be done where there is no vegetation (driveway, around farm buildings, etc.) so you can observe the oat kernels on the ground. Use of a strip of roofing paper stretched across the swath may help in observing the broadcasted oat kernels when determining swath width and subsequent application rate. Once a uniform swath width has been fixed, record the fan setting for future use.

Now, by adjusting the gate opening, determine the number of kernels being applied per square foot. Across the 20-foot swath, randomly place the square foot frame 10 to 20 times and count the kernels in

each frame. Average these frame counts. Adjust the gate opening and record gate settings for the following rates per swath-acre.

1.2 kernels per square foot = 3 lbs. per swath acre

2.4 kernels per square foot = 6 lbs. per swath acre (recommended amount)

4.0 kernels per square foot = 10 lbs. per swath acre

After calibrating the cyclone seeder by this method, one final calibration is necessary to confirm the application rate. First, divide the number of square feet in an acre (43,560 square feet) by the swath width you have selected. For a 20-foot swath, this would be 2,178 feet. This distance is equal to one swath-acre (43,560 square feet divided by 20 feet equals 2,178 feet). With a measuring tape, measure out this distance in an area which is to be treated with zinc phosphide oats. Weigh 15 to 20 pounds of zinc phosphide bait and place into the seeder. Apply the bait along the line which you have measured. Weigh the bait remaining in the seeder. The difference will be the number of pounds of bait actually applied per swath-acre. If this differs from the results obtained by counting the kernels per square foot, readjust your equipment.

Application

Zinc phosphide grain baits have a strong odor and application of the bait by itself may give poor or unsatisfactory results. The squirrels need to be conditioned to readily accept grain as a food source in order to achieve good control using zinc phosphide. A process called pre-baiting in which clean nontoxic oats of the same shape and type used for the toxic bait must first be applied 2 or 3 days prior to bait application. Calibration and application rates for the pre-bait will be the same as that of the zinc phosphide bait.

Ground squirrel control using the cyclone seeder is generally most effective where the density of ground cover vegetation is light to moderate. As density of ground cover increases, the rate of bait application must be increased. Economic costs and environmental concerns limit the maximum amount of bait applied. Applications greater than 6 pounds per acre are not recommended. Broadcast application of bait need not be continuous over the treated area. Where groundcover is light to moderate, unbaited intervals of 20 to 100 feet between baited swaths can be left. Figure 1 gives various application rates and swath intervals depending on vegetation cover.

Bait Application Rate	Swath Interval	Net Pounds Bait Per Acre	Vegetation Cover
6 pounds per acre	None	6 pounds	Heavy
10 pounds per swath-acre	20 feet	5 pounds	Heavy
3 pounds per acre	None	3 pounds	Medium
6 pounds per swath-acre	20 feet	3 pounds	Medium
10 pounds per swath-acre	100 feet	1.7 pounds	Light
6 pounds per swath-acre	100 feet	1 pound	None

Figure 1. Cyclone seeder application rates.

Application Precautions

Broadcast baiting takes advantage of the natural search and find foraging behavior displayed by ground squirrels. Care must be taken to apply bait when the squirrels are readily searching and accepting grain. The period from a week or two after emergence from hibernation until spring green-up (usually during the month of March) normally provides the best control and concentrates control efforts on the breeding population. Application of zinc phosphide bait at other times usually gives variable or poor control. Use of other rodenticide baits such as Rozol anticoagulant bait may be more successful at these times.

It is advisable to test for bait acceptance prior to treating an area with zinc phosphide bait. This can be accomplished by selecting 20 or more ground squirrel burrow openings 30 or more feet apart and placing a tablespoon of untreated nontoxic oats near the burrow openings. Flag or mark these burrows and return after a couple of days to see if the oats are consumed. If so, proceed with the pre-baiting and baiting operations. If the oats are not consumed, wait until grain acceptance improves.

Pre-bait and bait should consist of clean, hulless, slightly crimped oats that have also been heat-treated to prevent germination. Pre-bait that is heavily rolled or crimped and contains hull may plug the seeder's gate opening and not broadcast effectively.

Flaggers or GPS units should be used to ensure proper swath intervals and that baited swaths coincide with the pre-baited swaths.

Avoid any application of zinc phosphide grain baits in areas where waterfowl or other concentrations of seed eating birds are known to frequent. Consider alternative control methods or use scare techniques to keep non-targets from the treated area.

Ensure that dry, favorable weather will be present during the pre-baiting and baiting applications. The effectiveness of zinc phosphide deteriorates rapidly when it becomes wet. Keep activity to a minimum on treated areas for a few days after bait application to ensure that the rodents have every opportunity to consume the pre-bait and bait.

Before buying or using any pesticide product, read and understand the pesticide label. When not in use, store pesticides in locked, dry storage. If possible, buy and use the amount of bait needed for one season. Always keep pesticides in the original, labeled container. Dispose of empty pesticide containers according to label instructions. Do not burn bait bags.

For more information, contact

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