

COMPLETED PROJECT REPORT

Project Title: Bromethalin for California Ground Squirrel.

Research Agency: Genesis

Principal Investigator: Baroch

Budget: \$92,067.00

Summary:

This study assessed the field efficacy of 0.01 and 0.10% bromethalin-treated oat groats in bait stations against California ground squirrels (*Spermophilus beecheyi*). A secondary objective was to evaluate the potential nontarget hazards.

Work was conducted from April 25 - July 12, 1996. The bait was formulated at the Fresno Co. Agriculture Commissioner's bait mixing facility in Fresno, Calif. Bait analysis was performed by PM Resources of Bridgeton, Missouri. Tissue residues in recovered squirrel carcasses were analyzed at Genesis Laboratories of Wellington, Colo.

The study was conducted on the Bar Mountain Ranch approximately 24.5 mi east of Earlimart, Tulare Co, Calif. in the oak woodland zone of the Sierra Nevada foothills. Test substances were applied to 10 plots ranging in size from 11.0 to 13.9 ac. Each bait concentration was applied to 5 plots.

Ground squirrel activity on a central area of about 1.7 ac in each plot was evaluated before and after application of the test substances. In addition, squirrel activity on 5 untreated control plots of about 1.8 ac each was evaluated. A direct index of activity, visual counts, and an indirect index, active burrow counts, were used to estimate the bait efficacies.

Test substances were applied in 3 in diameter T-shaped PVC bait stations placed at about 75 ft intervals. The 0.01% bait was consumed at a rate of 1.8 lb/ac, or 0.0019 mg bromethalin/sq. ft. The 0.10% bait was consumed at a rate of 0.8 lb/ac, or 0.0083 mg bromethalin/sq. ft.

Squirrels were exposed to the test substances for 12-13 days before post treatment census gathering began. Bait was not retrieved from bait stations until after post treatment census gathering, giving a 19-20 day exposure period. Squirrel activity on the plots treated with the 0.01% bait decreased 60.4% according to visual counts and 37.3% according to active burrow counts. Squirrel activity on plots treated with the 0.10% bait decreased 64.5% by visual activity counts and increased 20.5% by active burrow counts.

Squirrel activity on the untreated control plots decreased 30.3% (visual counts) and 59.5% (active burrow counts). The decrease on the control plots were attributed to very hot weather during the post treatment census period. Efficacy calculations for treated plots were corrected for the decreased activity on control plots. Analysis of variance showed visual activity on treated plots was significantly different from that on the control plots. Visual activity changes were not significantly different between the 2 treatments. Analysis of active burrow counts only found significant differences between the 0.10% treated plots and the control plots.

Some squirrels on treated plots were fitted with radio transmitter collars to facilitate retrieval of carcasses. Regular carcass searches were made of all treated plots and an area extending approximately 225 ft beyond the plots. Fourteen and 5 dead ground squirrels were found on the surface of plots treated with 0.01% and 0.10% bait, respectively. Carcasses of 3 other rodent and lagomorph species were found on the treated plots. Necropsies confirmed test substance exposure in some but not all nontarget animals found. No secondary poisoning cases were found, although a coyote scat containing bait was found. Analysis of whole carcass tissues of 12 and 8 squirrels found mean residue loads of 1.01 mg (3.18 ppm) and 4.35 mg (11.2 ppm) of bromethalin from the 0.01% and 0.10% plots, respectively.

Baits were analyzed for active ingredient concentration immediately after mixing and again after field exposure. The nominal 0.01% bait assayed at 0.0088 - 0.0091% bromethalin initially. After 14 days exposure in bait stations, 3 samples assayed at 0.0087% bromethalin, representing a 4.4% decline. Then nominal 0.10% bait initially assayed at 0.0875 - 0.0914%. After 14 days exposure, 3 samples assayed at 0.0797%, a decline of 8.9%.

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