

COMPLETED PROJECT REPORT

Project Title: Field efficacy of rodent bait diphacinone treated grains using spot-baiting applications to control the California ground squirrel

Research Agency: Genesis Laboratories

Principal Investigator: J. Baroch

Budget: \$78,250

Background:

Background information is not available.

Objectives:

1. To determine the field efficacy of spot-baited 0.005% and 0.01% diphacinone treated grain for the control of California ground squirrels (*Spermophilus beecheyi*).
2. To determine the potential hazard to nontarget wildlife from the spot-baited diphacinone grain bait.
3. To measure the concentration and stability of the active ingredient, diphacinone, before and after field application.

Summary:

The test site was a large ranch in the plant-oak woodland zone of Madera County, California. The experimental start date was May 22, 1994. The experimental termination date was July 15, 1994. Each of the test substances was applied to 5 plots ranging in size from 11.5 to 18.4 acres.

A central area of approximately two acres in each plot was censused before and after application of the test substances. In addition, five untreated control plots of approximately 2 acres each were censused. A direct method of censusing, visual counts, and an indirect method, active burrow counts, were used to evaluate the bait efficacies.

Test substances were applied by the spot baiting method every other day for four applications immediately following the pre-treatment censusing. Bait was replenished only as needed on each occasion after the first application. The 0.005% bait was applied at a rate of 12.7 pounds per acre, or 0.0066 mg diphacinone per square foot. The 0.01% bait was applied at a rate of 10.4 pounds per acre, or 0.0054 mg diphacinone per square foot.

Regular carcass searches were made of all treated plots. An area extending 225 feet beyond the treated plots was also searched during the post-treatment census period for carcasses. Carcasses of ground squirrels and non-target species were collected. Whole carcass tissues of ten ground squirrel retrieved from plots in each treatment were analyzed for diphacinone residues. Non-target carcasses were retrieved and examined for evidence of test substance ingestion.

Squirrels were exposed to the test substances for 10-11 days between pre-treatment and post-treatment censusing. Squirrel populations on the plots treated with the 0.005% bait decreased 91.6% according to visual censusing and 92.2% according to active burrow counts. Squirrel populations exposed to the 0.01% bait decreased by 90.6 percent using visual counts and 95.7% using active burrow counts. Squirrel populations on the untreated control plots decreased 20.6% using visual counts and 22.2% using active burrow counts. Population decreases on the treated plots were significantly different from the control plots. Population decreases were not significantly different between the two treatments.

Seventy-six dead or moribund ground squirrels were found on the plots treated with 0.005% bait. Sixty-seven dead or moribund ground squirrels were found on the plots treated with the 0.01% bait. Carcasses of eight other rodent and lagomorph species were found on the treated plots. Necropsies confirmed test substance exposure to all eight species.

No secondary poisoning cases were observed. Turkey vultures (*Cathartes aura*) regularly found and consumed dead squirrels on the treated plots. In some cases they eviscerated the carcasses, leaving behind the entrails containing test substance.

Analysis of whole carcass tissue residues in recovered squirrels found mean residue loads of 0.48 mg of diphacinone in squirrels exposed to the 0.005% bait and 0.46 mg of diphacinone in squirrels exposed to the 0.01% bait.

Both baits were analyzed and found to be within certified limits before being applied in the field. Analysis of test substance samples exposed to field conditions for 9 days found the 0.005% bait had degraded to 0.0013.5% diphacinone. The 0.01% bait degraded to 0.0045.4% diphacinone in the same period.