

## COMPLETED PROJECT REPORT

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

**Research Agency:** Genesis Laboratories

**Principal Investigator:** J. Baroch

**Budget:** \$84,000

### **Background:**

Background information is not available.

### **Objectives:**

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

### **Summary:**

The study protocol was finalized and the study was initiated on March 22, 1995. The experimental start date was May 25, 1995. The experimental termination date was November 22, 1995. The study completion date is January 11, 1996.

The test site was on two adjacent ranches in the plant-oak woodland zone of Madera County, California. The test substances were applied to 10 plots (5 each) ranging in size from 12.0 to 19.6 acres.

Ground squirrel activity on a central area of approximately 2.5 acres in each plot was evaluated before and after application of the test substances. In addition, squirrel activity on five untreated control plots of approximately 2.5 acres each was evaluated. A direct index for estimating activity, visual counts, and an indirect index, 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 10.0 pounds per acre, or 0.0053 milligrams (mg) chlorophacinone per square foot. The 0.01% bait was applied at a rate of 9.4 pounds per acre, or 0.0098 mg chlorophacinone per square foot.

Regular carcass searches were made of all treated plots. An area extending approximately 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 squirrels retrieved from plots in each treatment were analyzed for chlorophacinone residues. Non-target carcasses were retrieved and examined for evidence of test substance ingestion.

Squirrels were exposed to the test substances for 12-13 days between pre-treatment and post-treatment censusing. Squirrel activity on the plots treated with the 0.005% bait decreased 84.3% according to visual counts and 85.3% according to active burrow counts. Squirrel activity on plots treated with the 0.01% bait decreased by 92.4% using visual activity counts and 78.0% using active burrow counts. Squirrel activity on the untreated control plots increased 31.0% using visual counts and decreased 7.5% according to active burrow counts. Activity decreases on the treated plots were significantly different from the control plots. Activity changes were not significantly different between the two treatments.

A total of 86 dead ground squirrels were found on the plots treated with 0.005% bait. A total of 78 dead ground squirrels were found on the plots treated with the 0.01% bait. Carcasses of 6 other rodents and lagomorph species were found on the treated plots. Necropsies confirmed test substance exposure in some but not all non-target species found.

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

Analysis of whole carcass tissue residues in recovered squirrels found mean residue loads of 0.19 mg of chlorophacinone in squirrels exposed to the 0.005% bait and 0.62 mg of chlorophacinone 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% (nominal) bait had degraded to 0.0035% chlorophacinone. The 0.01% (nominal) bait degraded to 0.0078% chlorophacinone when exposed for the same period.