COMPLETED PROJECT REPORT

Project Title: Field efficacy of rodent bait diphacinone treated grains used in bait stations to control the California ground squirrel

Research Agency: Genesis Laboratories

Principal Investigator: J. Baroch

Budget: $80,750

Background:

Background information is not available.

Objectives:

1. To determine the field efficacy of 0.005% and 0.01% diphacinone treated grain in bait stations for the control of California ground squirrels (*Spermophilus beecheyi*).

2. To determine the potential hazard to nontarget wildlife from the diphacinone grain bait in bait stations.

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 23, 1994. The experimental termination date was July 7, 1994. The test substances was applied to 2 plots ranging in size from 16.0 to 16.9 acres.

A central area of approximately two acres in each plot was censused before and after application of the test substance. In addition, two untreated control plots of 2.0 and 3.1 acres, respectively, were censused. A direct method of censusing, visual counts, and an indirect method, active burrow counts, were used to evaluate the bait efficacy.

The test substance was presented in plastic bait stations for 22 days starting immediately after the pre-treatment censusing. Bait stations were checked every third day and bait was replenished as needed to maintain a continuous supply. The bait was applied at a rate of about two pounds per bait station. Bait stations were placed at about 75 foot intervals near active burrows.

Consumption on the plots varied from 4.3 to 8.1 pounds per acre, or 0.0022 to 0.0042 mg

diphacinone per square foot. The variation among plots reflected different initial squirrel densities.

Regular carcass searches were made of the 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 were collected. Whole carcass tissues of seven ground squirrels retrieved from plots were analyzed for diphacinone residues.

Squirrels were exposed to the test substances for 22 days between pre-treatment and post-treatment censusing. Bait efficacy was 84.0 to 92.2% according to visual censusing and 81.8 to 87.0% according to active burrow counts. Squirrel populations on one of the untreated control plots increased by 28.6% and on the other decreased by 18.5% according to visual counts. Activity decreased on one control plot by 47.1% using active burrow counts. Active burrow census information from the other control plot was not used due to experimental error.

Twenty-six dead and moribund ground squirrels were found on the treated plots. Carcasses of four other rodent and lagomorph genera were also found.

No secondary poisoning cases were observed. Turkey vultures (*Cathartes aura*) were commonly seen near the plots.

Analysis of whole carcass tissue residues in recovered squirrels found mean residue loads of 0.45 mg of diphacinone in squirrels exposed to the 0.005% bait (N=7).

The bait was analyzed and found to be within certified limits before being applied in the field. Analysis of test substance samples exposed to field conditions in a bait station for 17 days found the bait degraded only slightly compared to stocks in storage.