

June 7, 2002

FINAL REPORT STUDY NO. 00-0471

STUDY TITLE:

Field Efficacy Studies Comparing 0.005% and 0.01% Diphacinone and Chlorophacinone Baits
for Controlling California Ground Squirrels (*Spermophilus beecheyi*)

FIFRA GUIDELINE:

96-12 Rodenticides on Farm and Rangelands
950.2500 Field Testing for Terrestrial Wildlife
70-A-SS Secondary Poisoning Mammal
70-B-SS Secondary poisoning Bird
70-C-SS Whole Body Residue, Target Species

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TEST DATES:

Study Initiation: January 1, 2001
Experimental Start: May 10, 2001
Experimental Termination: July 7, 2001
Study Completion: December 31, 2001

SPONSOR:

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STATEMENT OF NO DATA CONFIDENTIALITY CLAIMS

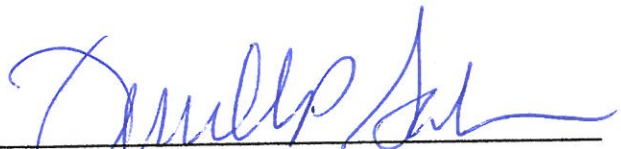
No claim of confidentiality is made for any information contained in this study on the basis of its falling within the scope of FIFRA 10 (d) 1 (A), (B) or (C).


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GOOD LABORATORY PRACTICE STATEMENT

The study contained herein, 00-0471, was not conducted in accordance with the requirements of Title 40, Code of Federal Regulations, Part 160, Good Laboratory Practice Standards. The primary difference was that a Quality Assurance Officer was not on site during the study. However, data and records were collected and will be kept in accordance with procedures consistent with Good Laboratory Practice studies. The following records will be kept: 1) maps of study sites and census areas, 2) general weather and site conditions, 3) data collected for bait acceptance, squirrel and burrow counts, bait applications, and bait quality analyses, 4) personnel training and qualification records.

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TABLE OF CONTENTS

Title Page.....	1
Statement of No Data Confidentiality Claims.....	2
Good Laboratory Practice Statement.....	3
Personnel Involved in the Study.....	4
Organizations Performing all Experimentation.....	4
Table of Contents.....	5
List of Figures.....	6
List of Tables.....	6
Location of Raw Data, Specimens, and Final Report.....	8
Acknowledgments.....	8
Summary.....	8
Introduction.....	10
Objectives.....	10
Study Areas.....	11
Methods and Materials.....	25
Schedule of Activities.....	25
Activity Indices.....	25
Bait Acceptance.....	26
Test Materials.....	27
Treatments.....	28
Target and Non-Target Species Recovery.....	29
Burrow Carcass Searching and Retrieval.....	30
Carcass Residue Analysis.....	30
Carcass Monitoring	31
Test Material Handling and Sampling.....	32
Bait Quality Assurance / Description of Analytical Methods.....	32
Statistical Methods.....	35
Results.....	36
Bait Acceptance.....	36
Treatment Bait Use.....	37
Activity Indices.....	41
Visual Counts.....	41
Burrow Counts.....	45
Baiting Efficacy.....	48
Target and Non-Target Species Recovery.....	52

Burrow Carcass Search and Retrieval.....	65
Carcass Residue Analyses.....	65
Carcass Monitoring.....	65
Bait Quality.....	69
Discussion.....	72
Issues of Concern.....	75
Literature Cited.....	78
Appendices:	
Appendix 1. Protocol.....	79
Appendix 2. Protocol Amendments.....	95
Appendix 3. Protocol Deviations.....	101
List of Figures:	
Figure 1. Map of California showing locations of Sites 1 - 4.....	11
Figure 2. Location of plots on Sites 1 and 2.....	13
Figure 3. Location of plots on Site 3.....	14
Figure 4. Location of plots on Site 4.....	15
Figure 5. Mean number of squirrels counted pre- and post-treatment periods..	52
Figure 6. Ground squirrel carcasses recovered over time.....	53
Figure 7. Site 1 carcass recovery locations.....	55
Figure 8. Site 2 carcass recovery locations.....	57
Figure 9. Site 3 carcass recovery locations.....	59
Figure 10. Site 4 carcass recovery locations.....	61
Figure 11. Comparison of toxicants, strength, and application methods.....	73
Figure 12. Efficacy estimates from field trials 1999 - 2001.....	74
Figure 13. Min-max temperatures from Shafter weather station.....	76
Figure 14. Min-max temperatures from King City weather station.....	77
List of Tables:	
Table 1. Description of Site 1 plots.....	16
Table 2. Description of Site 2 plots.....	18
Table 3. Description of Site 3 plots.....	20
Table 4. Description of Site 4 plots.....	22
Table 5. Schedule of research activities on plots.....	25
Table 6. Bait consumption relationships.....	27

Table 7. Test materials, percent active ingredient, and SLN numbers.....	27
Table 8. The 11 treatments applied at each study site.....	29
Table 9. Internal standards for anticoagulant extraction.....	33
Table 10. Extraction efficiency.....	33
Table 11. Comparison of duplicates.....	34
Table 12. Standard error as percent mass of 5 gm sample.....	34
Table 13. Consumption of clean grain for each plot on 4 study sites.....	36
Table 14. Amount of bait applied per plot and acre at Site 1.....	37
Table 15. Amount of bait applied per plot and acre at Site 2.....	38
Table 16. Amount of bait applied per plot and acre at Site 3.....	39
Table 17. Amount of bait applied per plot and acre at Site 4.....	40
Table 18. Ground squirrel counts at Site 1.....	41
Table 19. Ground squirrel counts at Site 2.....	42
Table 20. Ground squirrel counts at Site 3.....	43
Table 21. Ground squirrel counts at Site 4.....	44
Table 22. Percentage of ground squirrel burrows reopened at Site 1.....	45
Table 23. Percentage of ground squirrel burrows reopened at Site 2.....	46
Table 24. Percentage of ground squirrel burrows reopened at Site 3.....	47
Table 25. Percentage of ground squirrel burrows reopened at Site 4.....	48
Table 26. Baiting efficacy based on visual counts.....	50
Table 27. Baiting efficacy based on the burrow index.....	51
Table 28. Target and non-target carcasses recovered at Site 1.....	54
Table 29. Target and non-target carcasses recovered at Site 2.....	56
Table 30. Target and non-target carcasses recovered at Site 3.....	58
Table 31. Target and non-target carcasses recovered at Site 4.....	60
Table 32. Ground squirrel carcasses found on 4 study sites.....	62
Table 33. Carcass recovery index for 4 study sites.....	63
Table 34. Non-target carcasses recovered from 4 study sites.....	64
Table 35. Numbers of carcasses placed, consumed, or taken from plots.....	65
Table 36. Species taking or consuming carcasses.....	67
Table 37. Species not taking or consuming carcasses.....	68
Table 38. Predators and potential scavengers seen near study sites.....	69

Table 39. Strength of baits produced by Agriculture Commissioners.....	70
Table 40. Strength of baits weathered for 5 and 10 days.....	71
Table 41. Average strength of weathered bait grouped by toxicant.....	72
Table 42. Percentage of trials below selected efficacy standards.....	73

LOCATION OF RAW DATA, SPECIMENS, AND FINAL REPORT

All raw data, the original final report, all written communications between the performing laboratory and the sponsor regarding this project, and all original SOPs are kept at the facilities of the Department of Wildlife, Fish and Conservation Biology at the University of California in Davis, California.

ACKNOWLEDGMENTS

We appreciate the help of all the personnel listed above their help in the field study. Special thanks to Ralph Phillips of Kern County Cooperative Extension for help in locating the Bakersfield study site and for supplying ground squirrel carcasses for the camera and video monitoring. We thank Cathie Joughin, Tim Hearne, and Bill Whitney for access to their ranches and for their willingness to manage their livestock to accommodate the study. We thank Henry Gonzales, Bill Taylor, and Pam Everett of the King City office of the Monterey County Agricultural Commissioner's office for logistical help and identifying cooperators. We are grateful to Fred Rinder of the Fresno County Agriculture Commissioner's office and Les Wright of the Kings County Agriculture Commissioner's office for formulating and supplying bait, sometimes on short notice. We very much appreciate help with bait application and carcass searching provided by the many personnel from the California Department of Food & Agriculture. We thank Nick Condos of the California Department of Food and Agriculture who served as the initial Study Director.

SUMMARY

The U.S. Environmental Protection Agency (EPA) has stipulated in the Rodenticide Cluster Reregistration Eligibility Decision (RED) document that above ground uses of anticoagulant rodenticides containing greater than 0.005% of either chlorophacinone or diphacinone are ineligible for reregistration because of concerns over potential risks to non-target species. The California Department of Food and Agriculture (CDFA) supports all efforts to enhance the safety of its products, however, there are significant questions about the effect of this change on product efficacy, as well as the overall impact such a reduction would have on the potential secondary hazards when using these materials. The primary objective of this study is to determine the field efficacy of 2 rodent bait treated grains (chlorophacinone and diphacinone), each at 2 different strengths (0.005% and 0.01% a.i.), when applied by 2 different techniques (spot baiting and broadcast baiting) to control the California ground squirrel (*Spermophilus beecheyi*). A secondary objective of the study is to generate data useful for assessing and comparing the potential primary and secondary hazards associated with application of the different products.

We selected 4 study areas; Sites 1 and 2 were near Bakersfield in Kern County, and Sites 3 and 4 were near King City in Monterey County. We established 9 treatment plots and 2 control plots per site for a total of 44 plots. We used 2 methods to index ground squirrel population levels on each plot, visual counts and active burrow counts. We conducted bait acceptance tests with clean grain prior to baiting. The test materials (baits), prepared by the Fresno County and the Kings County Agriculture Commissioners, consisted of the anticoagulants chlorophacinone and diphacinone, each formulated at 0.005% and 0.01% active ingredient. We applied 11 treatments at each site, applying the bait or clean grain 2 times on each plot either by spot baiting and broadcast baiting. We systematically searched each plot for 12 days to recover dead target and non-target species. On Site 1 staff from the National Wildlife Research Center (NWRC) searched ground squirrel burrows using a video burrow probe device. Carcasses found during plot searches or recovered from burrows were sent to the NWRC lab in Colorado for residue analyses. We used TrailMaster cameras and a video surveillance system to identify species scavenging ground squirrel carcasses. We collected samples of all baits applied on the plots for analysis of active ingredient at the CDFA lab and the University of California lab.

We observed excessive declines in the numbers of ground squirrels on the control plots of Site 1, making the data from this site unreliable for assessing efficacy. Thus, all data from Site 1 were excluded from efficacy analyses. Based on ground squirrel counts, treatments exceeded the EPA 70% minimum efficacy requirement on 8 of 9 plots on Site 2, 9 of 9 plots on Site 3, and 7 of 9 plots on Site 4. There were significant decreases in ground squirrel numbers from the pre- to post-treatment periods resulting from the rodenticide treatments. We conclude there are no large differences in efficacy between chlorophacinone and diphacinone or spot or broadcast baiting. However, results from this study and previous field trials suggest the 0.01% baits outperform the 0.005% baits.

Overall we recovered 236 ground squirrel carcasses and 15 non-target carcasses, mostly kangaroo rats (*Dipodomys* spp.). An additional 23 ground squirrel carcasses were retrieved from burrows by NWRC personnel. Residue analyses of the carcasses have not yet been completed by NWRC. A complete evaluation of secondary hazards cannot be made until the residue results are available. From carcass monitoring we determined that 44 of 104 carcasses placed on the plots were taken or consumed by scavengers. We identified 4 species feeding on carcasses including common ravens (*Corvus corax*), turkey vultures (*Cathartes aura*), ground squirrels, and wild pigs (*Sus scrofa*).

Comparison between the analyses from UCD and CDFA for bait strength were generally in agreement. Only 1 of 16 lots was outside the acceptable deviation from the claimed bait strength. This lot was 0.0001% below the acceptable range so close that it would not affect results.

Issues of concern are addressed including estivation, overlapping buffer zones, carcass recovery on control plots, and bait weathering. Hot weather may have triggered estivation or a torpor in some squirrels at Sites 1 and 2 in Bakersfield. We did not observe squirrels traveling between plots and conclude the slightly overlapping buffers on Sites 1 and 2 had no significant effect. One or more dead squirrels were found on 5 of 8 control plots. Without residue analyses, we cannot confirm whether these deaths resulted from the anticoagulant treatments. Due to significant depredation of the bait weathering samples by insects and rodents, little useful data was obtained on changes in bait strength over time.