

PROJECT REPORT:

Project Title: Increasing Acceptance of Zinc Phosphide Baits

Research Agency: National Wildlife Research Center

Principal Investigator: Bruce Kimball

Budget: \$125,173.00

Background:

“Bait shyness” is a learned aversion of toxic baits resulting from sub-acute exposure to the toxicant. Although not specifically limited to bitterness, bitter-tasting toxicants are commonly subject to bait aversions. In learned aversions, the distinctive taste of the bait is associated with the toxic consequences of ingestion. If a rodent does not succumb to the toxin, the aversion can be quite strong and it is highly unlikely that the animal will ingest similar baits at any time in the future. Furthermore, aversions can be socially transmitted to offspring and conspecifics. Thus, bait shyness may significantly reduce bait efficacy in a population of rodents.

Voles cause significant damage to orchards, ornamentals, and field crops (O’Brien, 1994). In particular, voles are a significant problem in alfalfa (Schnabel, 2005) and artichoke (Salmon and Gorenzel, 2002). Zinc phosphide is a registered toxicant for the control of several rodents and its use has been increased as resistance to anticoagulant toxicants has become more widespread (Salmon, 2010). Of particular interest to California, zinc phosphide is registered for control of voles in pastures, rangelands, and sugar beets (grain baits); alfalfa, barley, dry beans, potatoes, sugar beets, and wheat (wheat baits); and artichokes (artichoke bract baits); as well as pocket gophers in croplands, rangelands, and pastures (grain baits).

However, zinc phosphide baits are subject to reduction in efficacy as a result of bait shyness. Thus, it has been recommended that zinc phosphide baits not be used in the same location more than once in any six-month period (Schnabel, 2005) even when more frequent use is permitted. Overcoming palatability issues of zinc phosphide baits will reduce sub-acute exposures and prevent formation of bait shyness within rodent populations.

The proposed research is designed to produce an improved zinc phosphide formulation that overcomes bait shyness in voles (and potentially other rodents).

Objectives:

Two approaches will be evaluated for reducing zinc phosphide bait shyness in voles. Acceptance and efficacy of the new formulations will be compared with the current formulation. Due to ease of use and because the majority of label uses of zinc phosphide for vole control specify grain baits, wheat baits will be used for testing. However, these results will be applicable for all zinc phosphide baits – regardless of carrier.

1) Zinc phosphide will be encapsulated in EPO and stearic acid prior to formulation in baits;

2) Sodium cyclamate and zinc sulfate will be used in the current formulation to suppress bait bitterness.

Progress To Date:

Last Updated:

01/22/2011