

COMPLETED PROJECT REPORT

Project Title: Nontarget hazard to free-ranging ring-necked pheasants exposed to a 2% zinc phosphide grain bait broadcast for vole control in alfalfa

Research Agency: National Wildlife Research Center

Principal Investigator: C. Ramey

Budget: \$96,300

Background:

Zinc phosphide is an acute rodenticide that has a variety of uses registered by the U.S. EPA and state regulatory agencies. Zinc phosphide was in the final stages of reregistration by EPA, as required by the Federal Insecticide, Fungicide, and Rodenticide Act. In anticipation of the potential data requirements to reregister state and federal registrations for zinc phosphide, CDFA sought definitive efficacy and nontarget data for their zinc phosphide rodenticide.

Objectives:

1. To provide field nontarget hazard data concerning the potential risk to wild and pen-reared ring-necked pheasants in an operation California vole control program in alfalfa using 2% zinc phosphide baits.
2. To compare the natural and zinc phosphide-related mortality rates of wild versus pen-reared pheasants released by the California Department of Fish and Game to support pheasant harvests.
3. To compare fall habitat use by wild and pen-reared pheasants in mixed crop systems of the Sacramento Valley.

Summary:

Nontarget hazards to 39 wild-caught and 32 pen-reared ring-necked pheasants (*Phasianus colchicus*) were studied using 2.0% zinc phosphide steam-rolled-oat (SRO) baits to control California voles (*Microtus californicus*) in alfalfa. Two study sites were in the Sacramento Valley near Meridian and Nicolaus. Following the capture and radio-collaring of wild pheasants and acclimation of pen-reared birds to radio-collaring, they were released into alfalfa fields. Several weeks after release of the pheasants, the alfalfa fields in the 2 areas were cut, dried, and baled. These fields were then baited by broadcast with either a placebo bait or zinc phosphide-treated bait. The label recommended broadcast rate of 11.2 kg/ha (10 lb/ac) of SRO results in only 26.9 grains/sq m (2.5 grains/sq ft). Habitat use and mortality of radio-collared

birds were monitored daily before and after baiting by radio telemetry. Fields treated with zinc phosphide baits were searched daily for animal carcasses post treatment using all-terrain vehicles.

No pheasants were killed as a result of the zinc phosphide baiting at the Meridian (treated) site. Of 19 wild pheasants and 18 pen-reared pheasants at the Meridian site that were monitored by radio telemetry, 20 died during the study. The primary cause of death was avian and mammalian predation (n=17, 85%); one other bird was killed by hunters (prior to the hunting season), one was hit by harvesting machinery, and another died of unknown causes. All mortalities were found in habitats other than alfalfa.

Only 28% of the pen-reared pheasants survived during the 4 weeks following release, while the survival rate of wild pheasants was 68%. Wild-caught male pheasants at Meridian moved a daily average of 290 m and females moved 285 m; pen-reared pheasants moved greater distances daily, with males averaging 390 m and females 327 m.

Of 815 pheasant locations determined using radio telemetry at the Meridian site, pheasants were located in alfalfa fields only 53 times (6.5%); only 3 of these times occurred in alfalfa after harvest. These data indicate that pheasants did not utilize alfalfa after cutting, either as foraging or resting habitat. Their use of other crop and non-crop habitats was as follows: milo (sorghum) - 368 times (45.2%), rice - 184 (22.6%), ditches - 89 (10.9%), corn - 52 (6.4%), orchards - 44 (5.4%), fallow fields 14 - (1.7%), melons - 6 (0.7%), beans - 3 (0.4%), and other - 4 (0.2%). No pheasants were found dead in alfalfa fields following treatment with zinc phosphide baits.

Of 20 pheasants and 14 pen-reared pheasants at the Nicolaus (control) site, 17 pheasants were killed by avian and mammalian predators. Only 29% of the pen-reared pheasants at Nicolaus survived during the 4 weeks following release, while 74% of the wild pheasants survived. Wild-caught males at Nicolaus moved an average of 295 m daily and females moved 276 m; pen-reared birds moved greater distances, with males averaging 335 m and females 382 m.

Of 927 pheasant locations determined using radio telemetry at the Nicolaus site, pheasants were located in alfalfa fields 133 times (14.3%), and only 5 of these times occurred in alfalfa after harvest and after baiting with placebo baits. Their use of other crop and non-crop sites was: rice 277 (29.9%), ditches 137 (14.8%), corn 136 (14.7%), sugar beets 126 (13.6%), fallow fields 66 (7.1%), safflower 26 (2.8%), sudan grass 21 (2.3%), orchards 4 (0.4%), and beans 1 (0.1%).

Zinc phosphide 2% SRO baits, used for vole control shortly following the last harvest of alfalfa in northern California, have little risk of causing nontarget poisoning of pheasants. No pheasants were found dead in alfalfa fields following treatment with zinc phosphide baits. Fresh-cut alfalfa fields were used by pheasants as resting or foraging habitat in only 4% of the radio locations.

Five passerines, including 2 juvenile American pipits (*Anthus rubescens*) and 3 western meadowlarks (*Sturnella neglecta*), were found dead during carcass searches on treated fields. The American pipits are primarily insectivorous, had empty stomachs, and probably were not zinc phosphide mortalities. Two of the meadowlarks contained treated baits in crops or stomachs and potentially could have been killed by eating zinc phosphide bait.

Last Updated: