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Kelly F. Swindle  
*The Avitrol Corporation*

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# AN EVALUATION OF 4-AMINOPYRIDINE BAITs COATED TO DELAY REACTION TIME

KELLY F. SWINDLE, The Avitrol Corporation, 7644 East 46th Street, Tulsa, Oklahoma 74145

**ABSTRACT:** In cold weather and early mornings, birds feeding on Avitrol<sup>®</sup> baits treated with 0.5, 1.0 and 3.0% (percent) 4-aminopyridine have shown reaction times as short as four minutes (reaction times of seven to ten minutes are common). Relatively fast reaction times, staggered arrival times of a flock at feeding sites, and delayed feeding by some members of a flock continue to result in premature reactions which frighten birds from the treated bait resulting in insufficient numbers reacting to give the desired repellency. This paper reports preliminary results of an effort to slow chemical absorption in an attempt to minimize this problem.

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## INTRODUCTION

European Starlings (*Sturnus vulgaris*) are an economic problem for animal feedlots. A Eurasian species first introduced in New York about one hundred years ago, they have since spread to all the forty-eight contiguous states, southern Alaska, Canada and now there are isolated sightings in the Hawaiian islands. They consume animal feed. Their droppings adulterate animal feed. They spread disease to most domestic animals. They are a filth and disease hazard for persons working the animals, and they are an irritant and nuisance because of the large numbers in which they appear.

The starling competes with native species for nest holes when paired off in the breeding season. Further, it has a habit of forming large winter roosts, sometimes with grackles and blackbirds. Starlings are semi-migratory. They are an aggressive and hearty species which will frequently stay the winter at relatively high latitudes provided feed is available. From their communal winter roost, they will fly many miles to a feeding site. This flight begins about daylight and is reversed prior to dark. For high plains roosts, the target of their morning flight is frequently a cattle feedlot where they shift from their normal food to bunk feeds, including grain. Our current interest is this habit.

Due both to the long distances the birds travel from their roosts to their feeding sites, and to the different staging areas used by the various flocks, their arrival times at the feedlots frequently vary by many minutes. Specific cases are flocks emanating from the Cheyenne Bottoms roost in Kansas and the Lake Meredith roost in the Texas panhandle. These are huge winter roosts from which flocks of starlings, including a few blackbirds, maraud the local feedlots.

## AVITROL<sup>®</sup> BAITs

Avitrol<sup>®</sup> Double Strength Corn Chops (1% 4-aminopyridine) has been used, generally with success, for many years to control problem starlings in feedlots. Because of its roots in agriculture, Avitrol has historically concentrated on making a fast acting bait. In some cases, especially where there are relatively large flocks which arrive over a period of time, the first arriving groups of birds will have reactors before the other birds arrive. These early reactions will invariably drive the blackbirds from the feedlot rather quickly. This phenomenon, in some cases, will result in these relatively few reactors not repelling the starlings from the feedlot, but rather repelling them from the treated bait sites. The starlings will then continue to feed in the bunks which they have been

conditioned to know are safe and ignore the bait. Starlings are very tough and will endure much more harassment than blackbirds.

The first attempt to resolve this problem was a studied effort to develop better baiting techniques to entice more birds to feed. A long term effort was undertaken to determine if a food other than cracked corn should be used as the carrier. To our surprise, cracked com was the food of choice compared to: bread, raisins, or peanut butter or oil coated bread, raisins and cracked com. We, however, did develop a better baiting scheme.

## METHODS AND DISCUSSION

The technique developed was to place small piles of bunk feed, direct from the feed track, about every thirty to fifty feet in the middle of the drive alleys. Then, once the birds had been conditioned to feed on these piles, to place the treated bait directly on top of these piles of bunk feed at daylight. This technique was highly successful at enticing birds from the bunks. But the problem of bait shyness in the above circumstances persisted. Next, the amount of treated bait used was increased dramatically. Mortality was increased, but the problem still persisted.

The next attempt to resolve this problem was to delay placement of treated baits until a larger portion of the flock had arrived. Because of heavy feeding in cold weather, this resulted in the early arriving birds having eaten so much untreated feed that the 4-aminopyridine was not digested quickly but rather metered out so that the reaction was reduced or absent altogether in these birds. Further, the portion of the flock arriving immediately following bait placement would then react so quickly that later arriving flocks would be diverted to bunks for feed with relatively few total birds reacting.

The only other item, in our control, is to increase the reaction time. This would allow placing the treated bait so it would be available to the early arriving birds, and to delay the chemical absorption to allow the later arriving birds to reach the feedlot and feed undisturbed by reactions from the early arrivals. This would, if effective, result in longer feeding times, a larger proportion of the flock present for feeding and the treated baits being consumed early in the feeding rather than added on top of a full gullet.

Two techniques to increase the absorption time were attempted. First we increased the size of the cracked corn baits from about twenty-five milligrams to thirty-five to fifty

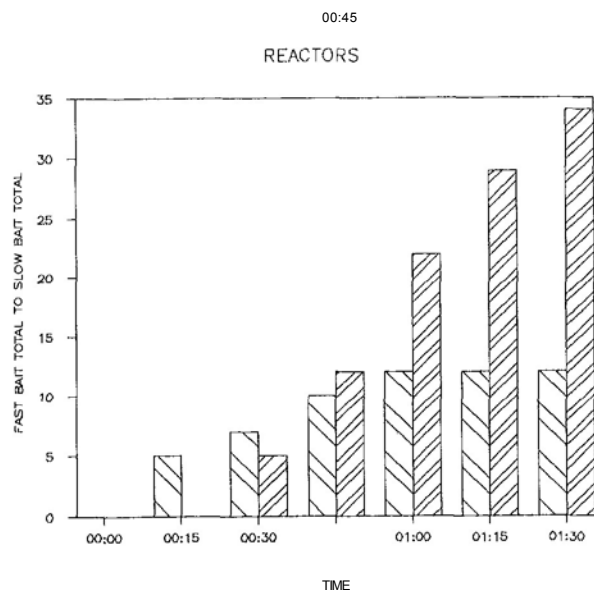


Figure 1. Relative reactions obtained by using the current fast acting bait (left bars) and variations of the coated bait (right bars).

milligrams. Combined with deep impregnation of the 4-aminopyridine, this gave slightly increased reaction times. Second, we used coating on the surface of the larger baits.

Varying amounts of two different coatings were used on Avitrol Double Strength Corn Chops.

- 1) Dow Chemical Company Latex-202 A with a zein additive from Freeman Industries, Inc. for flavor.
- 2) Ethylcellulose dissolved in methanol and again with a zein additive for flavor.

These were tested on small flocks of starlings with the result that both would delay reactions. The delay depended on the quantity of coating used and the actual field conditions. The work discussed herein was performed the winters of 1989-1990 and 1990-1991. No large scale commercial feedlot testing has been conducted with the coated baits. The only field tests conducted so far have been with small flocks and small amounts of bait. In one Kansas feedlot in January 1991, promising preliminary results were obtained.

Full scale testing was planned for the winter of 1991-1992. Unfortunately the winter of 1991-1992 did not come to my feedlots and the full scale testing has been postponed until the winter of 1992-1993. The results of this testing will be available in the future.

Figure 1. shows the relative reactions obtained by using the current fast acting bait (left bars) and variations of the coated bait (right bars). The coated baits, in small quantities on small flocks, significantly delayed reaction times and dramatically increased the relative number of reactions. We do not, at this time, know whether or not this can be duplicated on a large scale, nor, if so, whether or not it will give improved area repellency. This will be determined when the birds and cold weather return to my feedlot.

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