University of Nebraska - Lincoln
DigitalCommons@University of Nebraska - Lincoln

Bird Control Seminars Proceedings | Wildlife Damage Management, Internet Center for

11-7-1976

A PROGRESS REPORT ON A NEW AVICIDE: 2-CHLORO- 4-ACETOTOLIUDINE (CAT)

S. Anderson Peoples
University of California, Davis

Anne Barger
University of California, Davis

A. C. Crabb
University of California, Davis

R. G. Schwab
University of California, Davis

Follow this and additional works at: http://digitalcommons.unl.edu/icwdmbirdcontrol

Part of the Environmental Sciences Commons

Peoples, S. Anderson; Barger, Anne; Crabb, A. C.; and Schwab, R. G., "A PROGRESS REPORT ON A NEW AVICIDE: 2-CHLORO-4-ACETOTOLIUDINE (CAT)" (1976). *Bird Control Seminars Proceedings.* Paper 78.
http://digitalcommons.unl.edu/icwdmbirdcontrol/78

This Article is brought to you for free and open access by the Wildlife Damage Management, Internet Center for at DigitalCommons@University of Nebraska - Lincoln. It has been accepted for inclusion in Bird Control Seminars Proceedings by an authorized administrator of DigitalCommons@University of Nebraska - Lincoln.

A PROGRESS REPORT ON A NEW AVICIDE: 2-CHLORO- 4-ACETOTOLIUDINE (CAT)

S. Anderson Peoples, Anne Barger,
A. C. Crabb, and R. G. Schwab
University of California
Davis, California

In California Starlings are not only causing serious damage to many agricultural crops, but they are crowding out some of our native birds. In 1966 Decino, et al. found that a compound, DRC 1339 (CPT), was toxic to Starlings but not to mammals. Our laboratory studied this compound; and, due in part to this work, the compound was registered for use as an avicide for use in baits for control of Starlings at feed lots, dairies, and chicken farms with the trade name Starlicide. In our studies on its fate in the mammal, one of the metabolities was CAT, the acetylated derivative of CPT. Its toxidty was found to be just as great for Starlings as the parent compound but much lower for raptors and mammals. This suggested that it might be a better avicide than CPT, and Intensive studies are underway in cooperation with the U.S. Fish and Wildlife Service to get its EPA registration.

Physical Properties

The method of synthesis was developed by Crawford Brown of our staff, and 10 kg was synthesized for laboratory and field testing. Later, Eastman Kodak Company synthesized 50 kg of the compound at a cost which Indicates that it can be sold commercially at a reasonable price.

CAT is a white, crystalline solid which melts at 104° - 105°C and sublimes above 60°C. It is insoluble In water but is soluble in organic solvents as follows: acetone 63%, methyl alcohol 44%, m-pyrol 40%, ethyl alcohol 29%, isopropyl alcohol 28%, vegetable oils 3.0%. It is odorless, tasteless, non-irritating, stable to sunlight and moisture, and its solutions have a long shelf life.

Methods of Analysis

The compound isextracted from the baits with acetone and hydrolized by heating with 6N HCl for one hour at 100°C, splitting off the acetyl group and forming CPT. If an oil solution or an oily bait is to be analyzed, it is first saponfied by heating with 20% alcoholic KOH, acidified to give 6N HCL; the fatty acids are extracted with ether and the water fraction heated one hour at 100°C. The CPT formed is determined colorimetrically as described for arsanilic acid in the AOAC Laboratory Methods. A GLC method has been developed for tissue residues by Gary Westberg for his Master's Thesis, and it will soon be published.

Acute Toxicity Studies

The acute oral LD_{50} is 2.6 mg/kg in Starlings and 1.6 mg/kg in Coturnix. Two Kestrels survived an oral dose of 200 mg/kg. More will be tested as they become available. There was no secondary toxicity in raptors fed Starlings given twice the LD50 before being killed 15 minutes later. Rats survived a 3,000 mg/kg given orally, and higher doses could not be given due to the volume.

The only pathology produced in birds was the destruction of the renal tubules, which caused death by renal failure. The reason that CAT is as toxic as CPT was found to be due to an acylase in the Starling kidney (but not in the raptor or mammal) which releases CPT at the point where it exerts its toxicity.

Dermal and Eye Irritation

Pads of gauze saturated with a suspension of CAT were applied to the shaved backs of rabbits. There was no evidence of irritation, and a challenge a week later showed there was no sensitization. A 1% suspension in methyl cellulose was applied to the rabbit's eye with no evidence of irritation.

Practical Use of CAT As An Avicide

The formulation of a successful bait for use in feed lots, vineyards, and orchards is now underway. The material can be applied to pellets as an oil or m pyrol solution or simply incorporated as a powder in a cattle feed. The latter was used in a successful test at a local feed lot by mixing the CAT first with cottonseed meal as a pre-mix and then added to freshly parched corn mixed with warm fat to give a total bait of 120 gm/ton. After three days of pre-baiting, the bait was placed in front of the bunkers and was well accepted by the birds. It was estimated that there was a 90% kill of the 25,000 birds.

Other studies are underway. including spraying directly on grapes, placing the baits directly in the feed bunkers, and spraying roosts. All of these applications present special problems, not the least of which are residues in food animals or nearby crops.

The studies so far indicate that CAT is superior in many ways to CPT (Starlicide) due to its stability and lack of skin irritation, and the results of field tests should assure its registration as an avicide.