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## GROUND APPLICATION OF AVITROL<sup>R</sup> TO CONTROL BLACKBIRDS IN SUNFLOWERS

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### Abstract

During 1977, North Dakota Animal Damage Control of the U.S. Fish and Wildlife Service conducted a large-scale demonstration of blackbird control by applying the chemical frightening agent Avitrol FC corn chops-99S with calibrated ground equipment. We conducted the demonstration near Fuller's Lake, a roost containing one-half to three-fourths of a million blackbirds. Farmers in eight townships near Fuller's Lake could participate and pay for applications made by Animal Damage Control personnel.

We applied Avitrol with an electric seed spreader mounted above a small tractor. Unplanted strips or single rows of destroyed sunflowers provided access through fields. We applied the bait when we saw significant numbers of blackbirds feeding in a field and confined rebaitings to portions the birds were damaging. We estimated the blackbird roost population weekly and collected blackbirds feeding in sunflower fields for food habit study.

The program included 60 fields and a total of 2,183 hectares. Measured losses averaged 10.3 percent in treated fields. Information gained during this demonstration emphasized the need for improved methods of blackbird control and a reappraisal of Avitrol FC corn chops-99S under new cultural practices.

### Introduction

Research of 4-aminopyridine, Avitrol, as a blackbird frightening agent in sunflowers began in 1967 and the product was registered with the Environmental Protection Agency in 1976. Despite years of successful testing conducted by the Denver Wildlife Research Center (Guarino 1974, Besser and Cummings, 1975, Besser et al, 1977) and North Dakota Animal Damage Control (Unpublished Reports of the Division of Wildlife Services, North Dakota) many sunflower growers did not believe Avitrol could reduce blackbird damage. This disbelief stemmed from the widespread misunderstanding of the use of the product and confusion of frightening agents with avicides. It was evident that more education, with special emphasis on ground application of Avitrol, was necessary to convince growers that Avitrol is one of several tools they should consider in their control program.

In 1977, North Dakota Animal Damage Control decided to conduct a demonstration in an area where blackbird damage is traditional. The objective was to show sunflower growers how to apply Avitrol themselves at a reduced cost with increased effectiveness.

### Materials and Methods

During the winter of 1977 we held meetings with representatives of the North Dakota Department of Agriculture, Extension Service, National Sunflower Growers Association, Avitrol Corporation and the Denver Wildlife Research Center to discuss the best way to conduct the demonstration. With their suggestions we proceeded with plans to protect sunflowers within a 645 km<sup>2</sup> area near Fuller's Lake, one of the largest blackbird roosts in North Dakota. Fuller's Lake is located approximately 72 km northwest of Fargo, North Dakota and was selected because it would provide a good test of our control methods and we could refer to data previously collected there by Denver Wildlife Research Center personnel. We next held meetings with sunflower growers in the Fuller's Lake area to discuss our proposal. We selected eight townships near the roost that contained all of the major blackbird flight lines. We explained to the growers that they would have to pay for the Avitrol bait applications but Animal Damage Control personnel would observe the fields and apply the bait when and where necessary. We decided that a price of \$2.20/kg, collected by the National Sunflower Growers Association, was enough to cover the cost of the bait and provide a transition to private and custom application costs of the future. In addition, cooperating growers would have to leave cleared strips at prescribed distances or consent to let us knock down single rows to allow passage of ground equipment. The grower response at these meetings was favorable so we proceeded with plans to acquire the necessary equipment.

In July, I established project headquarters at Hope, North Dakota, and began locating and mapping the sunflower fields signed up with our program. I used index cards to record field size, location in the township and any shelterbelts or other blackbird attracting features. As the season progressed, my co-worker David Carney and I checked the fields daily to note the stage of sunflower maturity and look for blackbirds in the fields. We had to check 60 different fields and, as the damage season progressed, time constraints permitted only a check of some fields every other day and rely on help from the field owner.

I used a Kubota<sup>1</sup>, four-wheel drive, diesel tractor with a Cyclone electric seeder to apply the Avitrol. I constructed an adjustable frame to hold the seeder approximately 2.1 m above the ground and mounted this frame on the three-point hitch of the tractor. In the event of a breakdown, we had two of these tractor-seeder combinations plus a custom designed spreader that could also be mounted on the tractor. The tractor was only 92 cm wide and allowed field travel in single row cleared strips and minimized damage where we had to knock flowers down. The tractor's narrowness and high center of gravity reduced field travel and bait application to a speed of 5 km/hour, a much slower speed than we planned on.

The electric seeders spread the Avitrol in a 12.3 m swath and were calibrated to distribute 3.4 kg/ha before any treated material was applied.

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<sup>1</sup>Use of trade names does not imply endorsement of commercial products by the United States Government.

We felt that the presence of 500 or more blackbirds was enough to justify the first treatment and discourage a further build-up in that field. We discovered that partial treatment in some fields for the first application often moved the birds to untreated portions of the field. Following this discovery we made it a policy to treat the entire field the first treatment unless special circumstances arose.

We monitored treated fields for the presence of bait, its effectiveness and any changes in bird feeding locations. If additional treatments were necessary, we confined them to those portions of the field still receiving bird damage. I tried to keep the number of treatments to a minimum and yet provide the protection necessary. Rainfall of more than 1 cm reduces the effectiveness of Avitrol so I set up a rain gauge at Fuller's Lake to measure precipitation.

Throughout most of the damage season we made weekly counts of the blackbird population of the Fuller's Lake roost. Under the direction of Denver Wildlife Research Center personnel we positioned ourselves along the major flight lines and counted the birds as they left the roost around sunrise. During the season I collected blackbirds feeding in sunflower fields to measure blackbird damage. We used the template method of measuring damage (Stone 1972).

## Results and Discussion

### Field Statistics

Field sizes ranged from 10.1 to 129.5 hectares and the average size was 36.4 hectares. There was a total of 2,183 hectares signed up with our program with fields located in seven of the eight townships eligible. It is worth noting that 70 percent of our fields were within 1.6 km of a blackbird resting area so we were dealing with the higher risk fields around the Fuller's Lake roost. Distances of fields from the roost ranged from 1.6 to 21.1 km and averaged 10.8 km. We treated in 43 percent, 941 ha, of the total area signed up. Three total field treatments was the average but the range was one to ten. Damage measured in treated fields averaged 10.3 percent but ranged from less than one to 66 percent.

### Blackbird Food Habits and Population Estimates

Between August 10, 1977 and September 17, 1977, I collected 50 blackbirds feeding in sunflower fields to examine their gizzard contents. All but one of these birds were red-winged blackbirds (*Agelaius phoeniceus*), the remaining bird was a yellow headed blackbird (*Xanthocephalus xanthocephalus*). Sunflower seed and meal averaged 67.3 percent of the total gizzard contents but ranged from an average of 49.2 percent in August to 81.7 percent in late September. Although many different items were found in the gizzards studied, it was obvious that the blackbirds relied heavily on sunflowers to replenish energy reserves diminished during breeding and molting.

Reports indicate that red-winged blackbirds lose weight and fat deposits between March and August (Brenner 1967). Another study revealed that the

existence energy requirements of red-winged blackbirds increased from 29.9 kcal/bird-day in August to 45.7 kcal/bird-day in November (Brenner 1966). These energy requirements increase during the same period that the sunflower crop ripens.

Our weekly population estimates increased from a low of 141,000 birds on August 10 to a peak of 546,000 on August 31. The last count on September 14 revealed 514,000 birds.

#### Weather

The weather was the most important factor affecting our demonstration results. Unusually cool and wet weather through August and September had several adverse effects on our efforts. Precipitation, or the threat of it, ruined some treatments, postponed others and made field monitoring difficult due to impassable roads. The longest period without precipitation during August and September was five days (National Oceanic and Atmospheric Administration, 1977) and this doesn't include threatening days that made baiting a gamble. Rainfall also impeded sunflower maturation and inhibited harvest after the seeds were dry. Fields planted early and which matured in late September could not be harvested until mid-October due to poor weather. All of these factors prolonged crop exposure to the blackbirds and increased the overall loss figures.

#### Changes in Cultural Practices

Improved cultivars and changes in farm practices reduced the effectiveness of Avitrol and altered some blackbird habits. The increased use of fertilizers on vigorous hybrids produced very dense sunflower fields. The dense foliage coupled with the popular 77 cm rows made birds reluctant to feed on the ground. In addition, the dense fields made it difficult for Avitrol affected birds to fly up and display or be seen by other flock members. Telemetry data collected in the demonstration area (Besser et al, 1977) indicated that small groups of blackbirds were resting and even roosting in these dense sunflower fields instead of using shelterbelts and marshes. These factors combined to reduce the efficiency of Avitrol, a product tested under different conditions.

#### Evaluation of the Demonstration Results

As harvest proceeded and we concluded treatments, I talked to participants to find out how they felt about the demonstration. With the exception of two growers, all of them thought the treatments had been helpful and would consider using the product in the future. Most of the growers added that Avitrol alone is not sufficient for problem fields and that religious use of scaring devices should be included in the control program. The growers also said it was fortunate that Animal Damage Control personnel could spend the time checking the fields while the owners were busy elsewhere. The participants agreed that the demonstration was worthwhile and achieved satisfactory results considering the poor weather.

### Conclusions

The demonstration results emphasized the need for improved methods of blackbird control in problem fields. It appeared that the currently registered formulation of Avitrol for sunflowers was not effective enough in August and early September. Sunflowers were second to wheat in total income produced in North Dakota during 1977 and we expect an increase in sunflower acreage in 1978. As more farmers across the state include sunflowers in their rotation there will be increased conflict with blackbirds. We should not expect to find a single solution for all situations but instead develop a system composed of different tools that can be integrated to achieve acceptable results.

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### References Cited

- BESSER, J.F., C.E. KNITTLE, and W.J. BERG, 1977. Feeding patterns of radio-equipped red-winged blackbirds frightened from ripening sunflower fields in North Dakota. Bird Damage Research Report No. 61, Denver Wildlife Research Center. 22 pages.
- \_\_\_\_\_, and J.L. Cummings, 1975. Avitrol FC Corn Chops-99 baits for protecting sunflowers from blackbirds in North Dakota, Minnesota and South Dakota. Unpublished Report No. 59, Work Unit DF-102.3, Denver Wildlife Research Center. 27 pages.
- \_\_\_\_\_, R. BRUNTON, D. CUNNINGHAM and M. DUNCAN, 1977. The comparative effectiveness, safety and economics of two methods of protecting sunflower fields from blackbird damage in North Dakota. Bird Damage Research Report No. 42, Denver Wildlife Research Center. 12 pages.
- BRENNER, F.J., 1977. Energy and nutrient requirements of the red-winged blackbird. Wilson Bulletin 78(1):111-120.
- \_\_\_\_\_, 1967. Seasonal correlations of reserve energy of the red-winged blackbird. Bird Banding 38(3):195-211.
- DIVISION OF WILDLIFE SERVICES, 1969. Field test project on 4-aminopyridine. Mimeograph report of test conducted in 1969 by the Division of Wildlife Services, North Dakota. 8 pages.
- \_\_\_\_\_, 1970. Field test project on 4-aminopyridine. Mimeograph report of test conducted in 1970 by the Division of Wildlife Services, North Dakota. 4 pages.

- \_\_\_\_\_, 1971. Field test project on 4-aminopyridine. Mimeograph report of test conducted in 1971 by the Division of Wildlife Services, North Dakota. 5 pages.
- \_\_\_\_\_, 1972. Field test project on 4-aminopyridine. Mimeograph report of test conducted in 1972 by the Division of Wildlife Services, North Dakota. 10 pages.
- GUARINO, J.L., 1974. 4-aminopyridine for protecting sunflowers from blackbirds in Steele County, North Dakota. Bird Damage Research Report No. 45, Denver Wildlife Research Center. 28 pages.
- NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION, 1977. Environmental Data Service, Monthly Reports for North Dakota.
- STONE, C.P., 1972. November narrative report of activity, Denver Wildlife Research Center.