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USE OF DRC 1339 TO CONTROL CROWS IN THREE ROOSTS IN
KENTUCKY AND ARKANSAS

by Frank L. Boyd^{1/} and Douglas I. Hall^{2/}

ABSTRACT

Field tests utilizing DRC 1339 (3-chloro-4-methylbenzamine hydrochloride) 98% concentrate on whole kernel corn for crow (Corvus brachyrhynchos) control were conducted in January and February 1981 in Lexington and Louisville, Kentucky, and in 1982 in Ashdown, Arkansas. Treated bait was placed in staging areas near the roosts after prebaiting indicated good acceptance at the sites. The rate of acceptance varied with bait placement. Best results were obtained when bait was placed on bare ground at habitually used staging areas close to the roost site. Population reductions of up to 25% were obtained with limited baiting. DRC 1339 appears to be a safe, effective toxicant when used on whole corn and bait sites are monitored.

INTRODUCTION

Crows have long been associated with serious agricultural damage. Annual losses of pecans to crows in Louisiana have been valued at \$2 to \$6 million (Wilson 1974). Steiner et al. (1984) listed crows as a species involved with aircraft hazards where agricultural areas are near airports. Similar safety problems have been reported at airports not associated with agricultural areas (Anon. 1973). Crow/aircraft conflicts can be particularly dangerous near roost situations where morning and evening flight lines of crows intersect with aircraft flight patterns.

Traditional harassment and habitat alteration techniques for crow control (Timm 1983) are not always effective. In those situations population reduction would be the control technique of choice if safe and effective toxic baits were available.

DRC 1339 is a slow-acting avicide reported to be an effective crow toxicant (Simpson and Clark 1970). It has the advantages of slow action and relative selectivity. Approximate acute oral toxicity is 1.8 mg/kg for crows and red-winged blackbirds (Agelaius phoeniceus), compared to much higher figures for other birds: i.e., hawks 100-1,000 mg/kg; ducks 10-1,000 mg/kg; house sparrow 320-448 mg/kg (DeCino et al. 1966).

Field tests of DRC 1339 on whole kernel corn bait were conducted at three problem roost sites in Kentucky and Arkansas under authority of an Experimental Use Permit to evaluate the potential for use as a crow toxicant. All field tests involved historic crow problems where non-lethal control options had proved unsuccessful in reducing safety hazards or agricultural damage to acceptable levels. These conditions provided opportunities for field tests of DRC 1339 as a control tool while providing assistance with existing problems. The roosts in Lexington and Louisville, Kentucky, were in urban areas causing hazards to aircraft as well as health concerns at the site. The roost in Ashdown, Arkansas, was a rural site. Crows in this region are responsible for damage to peanuts, pecans, soybeans, wheat, and livestock food, as well as nuisance problems to residents living near the roost.

The Lexington roost was estimated to contain 30,000 crows and was located within the city limits. The roost and staging areas were unstable and often changed location. At least five roosting sites were identified, including tobacco warehouse roofs, a golf course, and the roof of a shopping mall. All roost sites were approximately 4.5 km from the Lexington airport with major morning and evening flight lines intersecting airport approach and departure patterns.

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Approximately six major staging areas shifted frequently during the project. Those sites included pastures, vacant lots, and a baseball field. Four of these sites were selected for baiting. Crows also were found feeding and loafing on airport property, as well as in the downtown areas, during the day.

An estimated 8,000 crows used the Louisville roost which was located in close proximity to the main runway of the Louisville airport. The roosting habitat was a hardwood stand located on the edge of a large train switching yard and was relatively undisturbed. Although smaller and more stable than the Lexington roost, the Louisville roost presented greater safety hazards. Several airstrikes involving crows were reported. Only two staging areas were found, both of which were constant and predictable. One staging area, located at a creosote treatment plant storage yard, was selected for baiting as approximately 90% of the crows staging before entering the roost used this site.

The Ashdown roost, used by 60,000 crows, was located in planted pines next to a paper mill in rural Little River County. Several feeding and staging areas within an 8 km radius of the roost were identified, but the sites were not used consistently and their use was difficult to predict. The two staging areas selected for baiting were an unused farm road adjacent to a pecan orchard and a plowed field. Another potential site was abandoned after prebait monitoring revealed mourning doves (*Zenaidura macroura*) using the area.

Cooperators with these field tests included local health and sanitation departments, airport personnel, city officials, the Federal Aviation Administration, Arkansas Cooperative Extension Service, Nekoosa Papers, Inc., and several private landowners.

METHODS AND PROCEDURES

Kentucky

The following bait formulation similar to that described by Simpson and Clark (1970) was used:

4.54 kg whole kernel corn
33 grams DRC 1339 98% concentrate
400 ml warm tap water.

DRC 1339 was placed in solution by mixing with warm water. At this concentration, there was a theoretical average lethal dose on each individual corn kernel. The solution was poured over the corn in a container and manually mixed. The treated corn was then spread on a plastic sheet and left to dry overnight (approximately 12 hours). After drying, treated bait received a coating of 20% Rhoplex AC-33 solution applied at the rate of 355 ml Rhoplex solution to 4.54 kg of treated corn to act as a masking agent. The corn was then spread on a plastic sheet to dry overnight.

The actual bait used was a 50% mix of treated and untreated corn. This percentage was selected after non-target considerations were evaluated and could be varied without greatly affecting success. In this case, very little non-target use (primarily by blackbirds) of baited sites was observed. Lower percentages of treated to untreated corn could be used in areas where potential non-target hazards may be more acute. The bait was placed in staging areas as close to the roost as possible after prebaiting with corn indicated good acceptance. Bait acceptance was best when corn was scattered thinly over areas where crows were staging on the ground.

Arkansas

A different bait mixing regime was utilized at the Ashdown roost site. A slightly higher DRC 1339 concentration was used without the masking agent; however, Rhoplex AC-33 was used as a sticker because we felt that a lethal dose might not be absorbed by whole kernels to the point where abrasion would not remove the material. The slightly higher rate was used to compensate for any increased loss of chemical due to the absence of a complete Rhoplex coating.

The following formulation and mixing procedure were used:

4.54 kg whole kernel corn
45 g DRC 1339 98% concentrate

300 ml warm water

50 ml Rhoplex AC-33.

A solution of 45 grams DRC 1339 was mixed with 300 ml of water and 50 ml of Rhoplex AC-33 to act as a sticker. The solution was then applied to 4.54 kg of corn in a container and manually mixed. The treated corn was thinly spread out on plastic sheets, exposed to the warm sun and 16 to 24 kmph wind. Drying time was about 2 hours. The treated (T) to untreated (UT) ratio was 1 T to 2 UT. This particular ratio was selected for several reasons: (1) reduced hazard to non-target species, (2) limited availability of whole corn, and (3) insufficient time and funds for more complete testing. Corn was hand scattered at baiting sites.

RESULTS AND DISCUSSION

Kentucky

At the Louisville roost, a substantial population reduction occurred after a single baiting that followed prebaiting for one week. This was the only baiting site used at this roost. Mortality was approximately 25%, based on visual estimates and actual ground counts. Most mortality occurred in and around the roost. Sick birds were found in the area with dead birds. The crows moved to a roost approximately 1.2 km away two days after treatment. Healthy crows did not use any area where dead birds were present. The new roost was used for approximately two weeks during which staging areas and movement patterns were constantly changing. Following this period, the roost was abandoned and no crows were found in the area.

Bait was taken at the Lexington roost during all times of the day instead of just evening staging times and thus mortality was more difficult to determine. The birds shifted roost sites three times. Several baitings were made in staging areas with varying success until an estimated 25% reduction in numbers of crows using the roost was noted. Percent reduction was not easily determined, as dead crows were being reported from various locations as well as around the roost sites. Reduction estimates were obtained from repeated

population counts as birds entered roosts in the evenings. Roost breakup began when an approximate 25% reduction was reached. However, some of this reduction could have been due to natural spring breakup, and not mortality, as early signs of mating behavior were observed. As observed in the Louisville roost, healthy crows avoided roost areas where sick or dead birds were located. Ground searches were conducted at bait areas and roost sites, and no non-target mortality was observed.

Feeding observations indicated that crows would make no effort to locate the corn and would actually have to stage at the bait site to feed on the bait. Crows staging just outside the bait site would not move short distances to feed on the bait, even if other crows were actively feeding at bait sites. Bare ground appeared to provide better acceptance than grassed areas, although this was not as important in these tests as location of the bait in relation to the actual staging areas. Therefore, greatest success was obtained when crows were staged on bare ground at the same location every evening. Acceptance was best at bait sites with thinly dispersed corn (approximately 34 kg/ha). Feeding behavior varied. Some crows ingested the entire kernel while others cracked the kernels with their beaks and then ingested the cracked material. Treated corn left in the staging areas began to darken a few days after treatment, thus providing a visual difference between treated and untreated kernels. However, no visual or taste aversion was noted.

Bait acceptance was higher at the more remote Louisville roost than at the Lexington roost. The urban Lexington roost required much more time and bait material. Thirty-five man days were expended on the two areas with 75% of the time devoted to the Lexington roost. Improved field techniques could reduce this time requirement.

Although actual population reduction was not large, airport managers indicated a substantial drop in aircraft pilot complaints and actual bird strikes. Observations also indicated a major reduction in crows utilizing airport property.

However, the intended objective, reduction of hazards to aircraft, was reached with approximately 25% mortality. Flock reduction could have been increased, but would have required additional manpower to monitor daily crow activity, identify feeding and staging areas, and conduct selective baiting of these locations.

Arkansas

Several baiting areas were used at the Ashdown roost with good prebait acceptance at active staging areas. Prebaiting time required for crows to begin feeding in large numbers was one day or less. The lack of consistent staging areas was more a problem than bait acceptance. Treated areas .8 km or less from the roost were used more heavily than sites further from the roost. Fifty sick and dead crows were counted in the roost after the first day of treatment. The second day post-treatment, 504 dead and dying crows were observed at the roost site. Other sick and dead crows were seen outside the roost. Non-target species were not found during observations.

Little or no bait aversion was exhibited by the birds. The change in procedure from using Rhoplex as a coating to mask the taste in the Kentucky tests to using it as a sticker in the DRC 1339 solutions in Arkansas did not result in a detectable difference in bait acceptance. Crows may have shown some preference for untreated kernels, but it was not enough to warrant use of a masking agent. Corn was eaten by some birds, while other birds cracked the corn and ingested the pieces. The only adverse occurrence observed was that the crows would not stage at the same site every evening. When crows did stage at the bait sites, the corn was readily taken whether it was scattered thinly or heavily.

Feeding areas have been used traditionally in DRC 1339 baiting programs for control of blackbirds in livestock feedlots. This works well for control of local damage, but seldom affects the roosting population, as only small percentages of the birds utilizing the roost use a particular feeding area.

Placing bait at staging areas near the roost allows for a higher percentage of the roosting population to be exposed to bait. These tests indicate that staging areas can be successfully used as baiting sites for population reduction at problem crow roosts. Staging areas near the roost site appeared best due to higher numbers of crows using these sites. Our results compare favorably to those of Simpson and Clark (1970) in California and would likely be the case in other areas where consistent staging areas near the roost can be utilized.

SUMMARY

Test results indicate that DRC 1339 can be a safe, effective toxicant for crows when applied to whole kernel corn with Rhoplex AC-33 as a masking agent or as a sticker and bait placement is monitored. Crows were successfully baited in staging areas when field observations indicated consistent use of the site. Crows were killed without using the Rhoplex as a masking agent at the Ashdown, Arkansas, site; thus saving a good deal of bait preparation time without noticeably sacrificing efficacy. This bait treatment showed the most promise for further refinement of formulations and mixing procedures. When applied at areas where crows concentrate to feed or stage throughout the roosting season, the avicide may well act as a population reduction tool. Disadvantages include considerable costs in terms of time and effort and the fact that there is no federal registration. Time requirements could have been reduced with the use of automatic bait mixers and spreading freshly treated bait more thinly (one layer) to dry. Registration for use in individual states could be accomplished through the 24(c) provision of the Federal Insecticide, Fungicide, and Rodenticide Act, as amended, which allows for individual state registrations under special local need; however, the U. S. Environmental Protection Agency encourages full registrations when possible. More rigorous field tests are necessary to obtain data to support a much needed federal registration.

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