Wildlife Services

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National Wildlife Research Center

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Reducing Blackbird and Starling Conflicts

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Major Cooperators

- Louisiana Rice Research Board
- Louisiana Rice Producers Association
- Louisiana Blackbird Committee
- USA Rice Federation
- Louisiana Rice Research Station (LSU)
- Delta Research Station (MU)
- Missouri Rice Research and Merchandising Council
- Gowan Company
- Syngenta Crop Protection
- National Sunflower Association
- North Dakota State University
- North Dakota Department of Agriculture
- Kansas Feedlot Association
- Indianapolis Downtowners Association
- Ohio Dairy Association

Groups Affected By These Problems

- Rice, sunflower, and corn producers
- South Dakota Oilseed Council
- North Dakota Department of Agriculture
- South Dakota Department of Agriculture
- Feedlot Owners Association
- Consumers of sunflower, rice, corn and other products
- Processors, manufacturers, suppliers, and sellers of sunflower, rice, and corn products
- Utility companies

National Wildlife Research Center Scientists Address the Concerns of Farmers, and Feedlot, Dairy and Urban Area Managers

Wildlife Services' (WS) National Wildlife Research Center (NWRC) is the only Federal research organization devoted exclusively to resolving conflicts between people and wildlife through the development of effective, selective, and socially responsible methods, tools, and techniques. NWRC's field station in Bismarck, ND, evaluates and develops methods for managing national blackbird damage to sunflower, rice, and corn in the Great Plains. The field station also assists with national problems involving European starling damage and diseases in urban areas, feedlots, and dairies as well as woodpecker damage to utility structures and buildings.

Blackbirds and starlings damage grain crops and eat livestock feed, resulting in significant economic losses for agricultural producers. NWRC scientists are studying ways to refine current damage abatement methods and develop new methods for reducing damage. Additionally, researchers are looking for methods to expand capabilities for targeting specific problem-causing birds. Red-winged blackbirds, common grackles, yellow-headed blackbirds and brown-headed cowbirds cause an estimated $20 million worth of damage to newly planted and ripening rice in Arkansas, California, Louisiana, Missouri and Texas, $15 million worth of sunflower damage in North Dakota and South Dakota, and $35 million worth of damage to ripening and newly planted corn nationally. Some individual rice and sunflower growers report 100 percent in losses due to bird depredation.

NWRC scientists routinely work with producers, commodity groups, research boards, universities, and local, State and Federal agencies to develop safer and more effective methods to reduce bird depredation on seeded and ripening sunflower, corn and rice and improve profitability for growers. To develop new methods and tools, NWRC scientists conduct multifaceted research studies involving the use of both captive and free-ranging birds to determine the status of blackbird populations in the sunflower-, corn- and rice-growing States, estimate the economic impacts of birds on the crops, evaluate and develop nonlethal repellants for deterring birds and improve the effectiveness and safety of avicides for reducing depredating populations.

Applying Science and Expertise to Wildlife Challenges

Conservation Sunflower Plots Benefit Birds and Farmers— Large flocks of blackbirds congregate in the northern Great Plains from August to October in preparation for a strenuous migration to southern wintering areas. Blackbirds acquire energy for migration by eating agricultural crops, especially sunflower. Red-winged blackbirds, common grackles and yellow-headed blackbirds cause most of the damage. Sunflower producers in North Dakota and South Dakota lose $15 million to blackbirds annually. Approximately 988,000 acres of sunflower are planted annually in North Dakota, more than any other state.

NWRC and North Dakota State University (NDSU) researchers examined migratory bird use of croplands in North Dakota and found species diversity and densities to be highest in wildlife conservation sunflower plots (WCSP) compared to commercial sunflower or other non-sunflower row-crops such as corn, soybeans and wheat. The research findings aid in the development of guidelines for future WCSP placement and management to improve migratory bird habitat while retaining productive agricultural practices.

WCSP (or "lure" crops) are a nonlethal wildlife damage management method used to reduce blackbird damage to ripening commercial sunflower crops. The goal is to keep birds in the WCSP as long as possible, thereby reducing the time they spend feeding in nearby commercial sunflower fields. The most successful WCSP for reducing blackbird damage are those planted between wetlands and commercial fields. NWRC scientists

and NDSU collaborators observed more dense communities of fall migratory birds in WCSP and commercial sunflower fields compared to other non-sunflower crops.
The cost-benefits associated with WSCP are still being evaluated; however, scientists are hopeful that the proper placement and management of WCSP will provide sunflower producers with an economically viable nonlethal blackbird damage management option that also improves wildlife habitat for other migratory birds.

Starling Population Management Modeling— Urban areas, feedlots and dairies are major gathering sites of European starlings in the winter. Starlings eat valuable livestock feed, defecate on livestock, facility superstructures, feeder troughs and feed and are a potential reservoir of diseases transmissible to livestock and humans. WS personnel manage starling numbers with an avicide, but, previously, lacked a standardized methodology to estimate mortality at feedlots and dairies. NWRC scientists developed a bioenergetics model for estimating bird mortality during baiting operations using DRC-1339. The information is used to document the avicide's effectiveness and impact on target species as part of the National Environmental Policy Act.

Chemical Repellents for Sunflower— NWRC scientists continue to develop the use of 9,10- anthraquinone (AQ) for repelling birds from newly planted seeds and ripening crops. Ring-necked pheasants can cause localized damage to newly planted sunflower. Ring-necked pheasants avoided emergent seedlings treated with 15800 ppm AQ seed treatments during a caged preference test. Researchers conducted laboratory and field efficacy studies with common grackles and AQ-treated confectionary sunflower. Captive common grackles reliably discriminated between untreated sunflower and seeds treated with 1300-ppm AQ. During a field efficacy study for ripening confectionary sunflower, NWRC scientists observed 18 percent damage among AQ-treated enclosures and 64 percent damage among untreated enclosures populated with common grackles. Supplemental field efficacy studies are still needed for the development of AQ-based repellents for managing avian depredation of ripening agricultural crops, including oilseed sunflower. Information from this and other studies will be used in the registration of future repellents with the U.S. Environmental Protection Agency.

Radio-telemetry to Monitor European Starling Movements— To learn more about the movements of invasive European starlings, NWRC scientist attached small radio transmitters to starlings in downtown Indianapolis, Indiana and Omaha, Nebraska; at five dairy farms in Ohio; three feedlots in Kansas; and in central New Jersey. Scientists found that starlings move readily among farms, feedlots and cities. Birds captured in central New Jersey were less consistent in their daily use of areas and were less cohesive in their roosting aggregations compared to similar populations in Midwest landscapes with a higher percentage of agricultural habitats. These results are significant because starlings can carry transmissible gastroenteritis (TGE), *E. Coli*, *Salmonella* spp., and Johne's disease. These pathogens can result in death and illness in pigs and cattle, costing nearly $1 billion in losses annually.

Anthraquinone To Alleviate Non-Target Take From Rodenticides— Rodenticides are a key component for crop protection, and reducing non-target exposure to rodenticides is an important consideration in the maintenance of existing pesticide labels and the development of new rodent control methods. In an effort to reduce the non-target risk associated with rodenticides, NWRC scientists explored the possibility of adapting currently registered bird repellents (i.e., anthraquinone) for incorporation into these materials. NWRC studies showed that adding an anthraquinone repellent prevents the consumption of rodenticide baits by Canada geese and ring-necked pheasants. Captive geese avoided baits treated with 2-percent zinc phosphide (typical concentration level used in rodenticide applications) and 2- to 2.5-percent anthraquinone (Arkion® Life Sciences). Although some geese and pheasants initially sampled treated baits, all birds subsequently avoided treated baits. No mortality or signs of zinc phosphide poisoning were observed among 10 geese and 40 pheasants that were offered the repellent-treated zinc phosphide baits.
Additional NWRC studies are underway to evaluate the efficacy of the new anthraquinone-zinc phosphide bait for target rodent species. NWRC researchers also plan to investigate the possible uses of this new bait in reducing non-target hazards with other pesticides, to compare costs relative to expected damage at unmanaged sites, and to assess the bait's environmental impacts.

Woodpecker Deterrent for Utility Pole Crossarms— Woodpeckers cause millions of dollars in damage to wooden utility pole structures around the world by pecking or drumming at the structures when searching for insects, announcing their territory, or excavating nesting or roosting cavities. The resulting damage presents a safety hazard to utility workers, promotes decay (due to water entrapped in the holes), necessitates premature replacement, and can lead to collapse under adverse conditions. In the United States, pileated woodpeckers *(Dryocopus pileatus)* cause some of the most severe damage to poles.

In captive studies at the NWRC, researchers evaluated the effectiveness of a polyurea elastomer coating material being applied in a process developed by Brooks Manufacturing Company (Bellingham, WA) to eliminate or reduce damage to crossarms by pileated woodpeckers. Pileated woodpeckers captured and later returned to national forests in Missouri and Arkansas were presented with coated and non-coated crossarms. Fully coated crossarms received no measurable damage, whereas woodpeckers severely damaged non-coated crossarms. More studies are needed to determine whether coated wood crossarms are more cost effective than other materials over the lifetime of the utility structure.

Selected Publications:

BYRD, R. W., J. L. CUMMINGS, S. K. TUPPER, and J. D. EISEMANN. 2009. Evaluation of sodium lauryl sulfate as a blackbird wetting agent. Proceedings of the Wildlife Damage Management Conference 13:191-196.

HAGY, H. M., G. M. LINZ, and W. J. BLEIER. 2010. Wildlife conservation sunflower plots and croplands as fall habitat for migratory birds. American Midland Naturalist 164:119-135.

GALLE, A. M., G. M. LINZ, H. J. HOMAN, and W. J. BLEIER. 2009. Avian use of harvested crop fields in North Dakota during spring migration. Western North American Naturalist 69:491-500.

GAUKLER, S. M., G. M. LINZ, J. S. SHERWOOD, N. W. DYER, W. J. BLEIER, Y. M. WANNEMUEHLER, L. K. NOLAN, and C. M. LOGUE. 2009. *Escherichia coli, Salmonella,* and *Mycobacterium avium* subsp. *paratuberculosis i*n wild European starlings at a Kansas feedlot. Avian Diseases 53:544-551.

HAGY, H. M., G. M. LINZ, and W. J. BLEIER. 2010. Wildlife conservation sunflower plots and croplands as fall habitat for migratory birds. American Midland Naturalist 164:119-135.

HOMAN, H. J., G. M. LINZ, S. BECKERMAN, A. G. DUFFINEY, and T. D. HALSTEAD. 2010. European starling preferences for bait substrates used in DRC-1339 applications. Human-Wildlife Interactions 4:25-31.

KLOSTERMAN, M., G. M. LINZ, A. A. SLOWIK, and W. BLEIER. 2010. Assessment of bird damage to sunflower and corn in North Dakota. Online: National Sunflower Association Research Forum (http://www. sunflowernsa. com).

SCHAAF, D. A., G. M. LINZ, C. DOETKOTT, M. W. LUTMAN, and W. J. BLEIER. 2010. Non-blackbird avian occurrence and abundance in North Dakota sunflower fields. Prairie Naturalist 40:73-86.

TUPPER, S. K., W. F. ANDELT, J. L. CUMMINGS, C. WEISNER, and R. E. HARNESS. 2010. Polyurea elastomer protects utility pole crossarms from damage by pileated woodpeckers. Journal of Wildlife Management 74:605-608.

WERNER, S. J., J. C. CARLSON, S. K. TUPPER, M. M. SANTER, and G. M. LINZ. 2009. Threshold concentrations of an anthraquinone-based repellent for Canada geese, red-winged blackbirds, and ring-necked pheasants. Applied Animal Behaviour Science 121:190-196.

WERNER, S. J., G. M. LINZ, S. K. TUPPER, and J. C. CARLSON. 2010. Laboratory efficacy of chemical repellents for reducing blackbird damage in rice and sunflower crops. Journal of Wildlife Management 74:1400-1404.

Major Research Accomplishments:

- WS developed a strategy to plant Wildlife Conservation Sunflower Plots to reduce damage to commercial sunflower fields and provide habitat for other animals.
- WS developed a model to estimate the avicide DRC-1339's effectiveness and impact on starling populations.
- WS evaluated the efficacy of 9, 10 anthraquione as a potential blackbird repellent for use on newly planted sunflower, corn, and rice seed to repel feeding pheasants and blackbirds and to reduce blackbird damage to ripening sunflower and rice.
- WS determined that combining anthraquinone with rodenticide baits helps to prevent the consumption of baits by non-target bird species, such as Canada geese and ring-necked pheasants.
- WS evaluated the effectiveness of a polyurea elastomer coating material for eliminating or reducing woodpecker damage to utility pole crossarms.