Greater Sandhill Crane

A3897

Protect your corn from cranes

Anne Lacy, Eileen Cullen, Jeb Barzen, and Sarah Schramm

Anthraquinone seed treatment spares crop

If cranes damaged your fields in the past or if you are in a high-risk area, a preventative seed treatment may be warranted.

In an unusual twist, a conservation success story has created a potential pest for Wisconsin corn growers. The resurgence of the eastern population of greater sandhill cranes (*Grus canadensis tabida*) has been impressive, with an increase statewide from about 3,000 cranes to about 14,000 in three decades. As the population rebounds, however, farmers increasingly find themselves at odds with these birds as they forage in, and often damage, seedling corn. With nearly 3 million of the state's approximately 4 million acres of corn as potential crane habitat, the possible economic impact of corn depredation by cranes is serious. This fact sheet describes the behavior of the sandhill crane so that growers can better understand which means of protecting their crop are effective, and why.

The problem

Sandhill cranes turn to corn seeds as a source of food in the spring, when emerging seedlings key the bird in to the kernels underground. The seedling leaves are usually unearthed in the probing process, and while they are not consumed, the plant will die. Once the young corn plants use up the seed endosperm resource, cranes will no longer damage planted corn.

Cornfields within 1.2 kilometers (¾ mile) of emergent wet meadows are the most at risk for crop loss from cranes feeding on planted kernels. In fields used by sandhill cranes in high-risk areas, the average loss in untreated corn is 20%. However, losses can reach 50 to 60% in severe cases. In Wisconsin, high-risk areas include Columbia, Dane, Dodge, Green Lake, Jefferson, Marquette, Waushara, and Winnebago counties, which contain up to 60% of Wisconsin's sandhill crane population (figure 1). Though high-risk areas indicate where crane density in Wisconsin is at its greatest, sandhills are distributed throughout the state and are highly visible. They can cause damage anywhere.

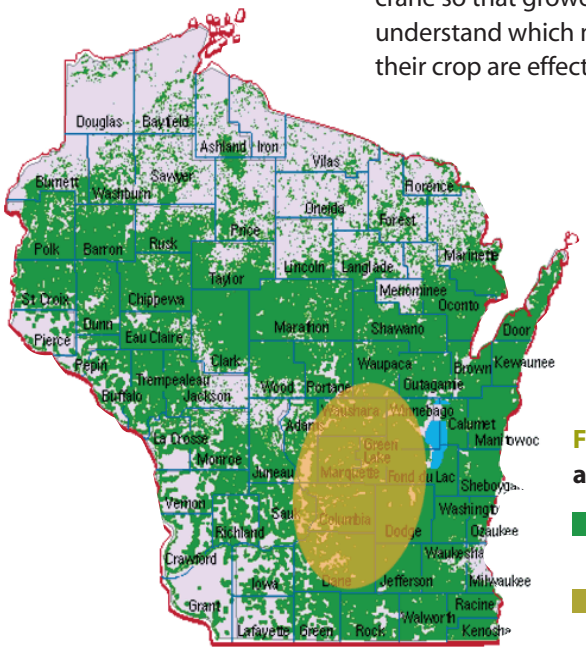

Figure 1. Wisconsin cornfields potentially at risk of crane damage.

- Agricultural land within 1.2 kilometers (¾ mile) of emergent wet meadow crane habitat
- Area of highest crane density

What crane damage looks like

Crane damage is evident by their feeding pattern in cornfields (figure 2). Cranes feed by walking down planted rows of corn, probing the soil with their beaks and pulling out seeds attached to emerging corn plants without disturbing the surrounding soil.

Figure 2. Sandhill crane feeding pattern in a row of untreated corn

Crane behavior

To implement effective solutions for cranes feeding on corn, it is important to first understand the basics of sandhill crane behavior. Wisconsin's sandhill cranes are migratory birds that overwinter in the southeastern United States (figure 3) and move north in the spring. Breeding birds will reach their territories in the Upper Midwest as early as February; non-breeding birds arrive closer to April.

In Wisconsin, the preferred crane habitat is emergent wet meadows for sleeping at night (roosting) and nesting. Agricultural land near these wetlands is attractive to cranes not only because of the foraging opportunities, but also because agricultural land is flat and clear, allowing the birds to see potential dangers. Because of this security, sandhill cranes often spend most of the day in fields, not only feeding but also socializing and resting, returning to wetlands at night—and often at midday—to roost.

Cranes can be found in cornfields from March through July, at which point the corn becomes too tall for the cranes to easily move through and see above. The birds then seek out other open areas, like cut alfalfa and winter wheat stubble, and spend more time in wetlands. Cranes remain in their Upper Midwest territories through November and then begin their winter migration south.

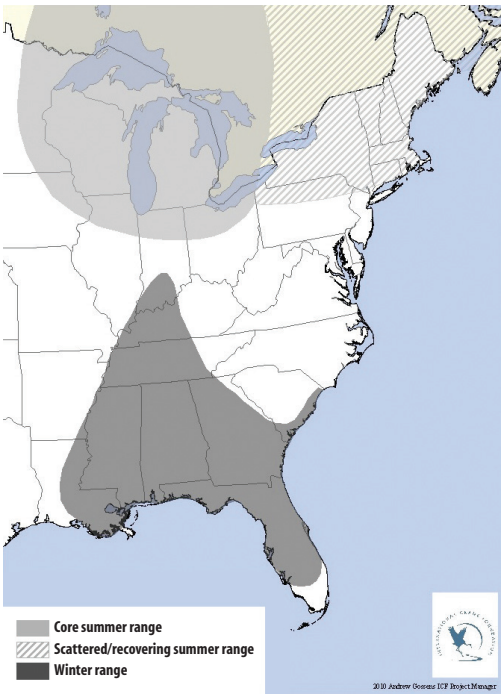

Figure 3. Distribution of the eastern population of greater sandhill cranes in summer and winter.

In addition to corn kernels, sandhill cranes feed on a variety of plants and animals, including tubers, waste grains from the previous year's crop, small vertebrates such as mice and snakes, and invertebrates like soil insects and earthworms. Although they will continue to use cornfields as habitat, cranes will eat other things if the corn crop has been chemically treated with a non-lethal bird-repellent seed coating.

Past attempts at control

Lindane

In the past, an organochlorine insecticide labeled as a corn seed treatment for soil insect pest control—with the active ingredient lindane—was known to have a coincidental deterrent effect on cranes. For years, farmers who used lindane corn seed treatments for insect control in high-risk sandhill crane areas avoided crane damage to their corn.

In 2006, the United States Environmental Protection Agency (US EPA) cancelled lindane registrations for seed treatment, including corn. Some of the seed-applied insecticides for soil insect pest control that replaced lindane have trade names similar to the products that previously contained lindane. For example, Kernel Guard was one of several planter box seed treatments that contained lindane. The current product, Kernel Guard Supreme, contains the pyrethroid insecticide, active ingredient permethrin, not lindane. None of today's insecticide/fungicide corn seed treatments will repel cranes from corn seed or germinating plants.

Scare tactics

Though occasionally effective when first deployed, scare tactics such as cannons, flags, and pyrotechnics are ineffective at preventing crane damage on a long-term basis. Long-lived cranes return to the same areas each year, often for a decade or two, and quickly learn that these methods will not harm them. Even when the scare tactics temporarily work, these techniques simply relocate the problem by moving the cranes between fields instead of preventing corn feeding altogether.

Lure crops and bait piles

Similar to scare tactics, lure crops and bait piles only move the problem instead of protecting the corn crop. Lures and baits can actually bring more cranes into an area, increasing the likelihood that the birds will move on to nearby cornfields once the bait is depleted.

Hunting and take permits

Though crane hunting occurs in some states that contain the eastern population, it is not an effective control strategy for crane damage to corn planted in the spring. Hunting occurs in fall, when the threat of crop damage from cranes is nonexistent. Federal depredation permits, issued locally by the U.S. Fish and Wildlife Service, have been approved in limited cases, but there are no data to suggest that these take permits are effective at controlling crane damage to corn. In the spring, the attraction of cranes to cornfields as part of their extensive home range is so strong that the crane population would have to be dramatically reduced to have any noticeable reduction in the use of cornfields for foraging.

Seed treatment as a solution

Several studies have demonstrated that the biopesticide 9,10-anthraquinone (AQ) is an effective and non-lethal bird repellant. This chemical is sold as Avipel (previously sold as Avitec) and is only commercially available for use on corn seed through a Section 24(c) Special Local Need registration. This authorization permits the time-limited use of Avipel on field and sweet corn seed in Wisconsin. Without this authorization from the Wisconsin Department of Agriculture, Trade and Consumer Protection and the US EPA, the use of Avipel for corn seed treatment would not be allowed since the product has not yet been registered with the US EPA or in Wisconsin. Minnesota, Michigan, and Texas have a similar Section 24(c) authorization for use of Avipel to prevent crane damage. US EPA previously authorized use of Avipel on corn seed in Wisconsin through a Section 18 emergency exemption. A Section 3 national registration with US EPA for this use is anticipated. For more information, check with your University of Wisconsin-Extension county agriculture agent (see **Resources**).

AQ is a chemical derived from plants and is thought to affect cranes as a taste deterrent or a gut irritant. Although Avipel is technically a pesticide in that it repels a pest (cranes), it is important to remember that it has **no insecticidal properties.** When cranes first encounter Avipel-treated seeds they learn that all germinating seeds have been treated. **Cranes then move on to other food items, such as soil insects, earthworms, and waste grain, but remain in the cornfield.** Treating corn seed with AQ effectively removes planted corn from the cranes' "menu."

Avipel is sold as both a liquid and a powder corn seed treatment (Avipel Hopper Box). Both forms are effective when the corn seed is thoroughly coated with the proper dose of active ingredient; research trials have shown both liquid and powder seed treatment provide reliable seed coverage and consistent results in protecting corn from crane depredation.

Cranes gather in agricultural fields. Effective use of a deterrent ensures this behavior is benign.

If pretreated corn seed is not available from your seed dealer, contact your local agricultural supply retailer, coop, or certified seed treatment provider to obtain liquid Avipel seed treatment. You may also contact the product registrant, Arkion Life Sciences, directly for the latest information on obtaining professional liquid Avipel seed treatment in your area (see **Resources**). Applying liquid Avipel yourself on-farm without seed treatment equipment may result in an inadequate amount of active ingredient per corn kernel and reduced efficacy.

Cranes do not always return to the same fields every year but they do return to the same area. If you had crane feeding in the past or if you are in a high-risk area, a preventative seed treatment may be warranted. For more information, contact your University of Wisconsin-Extension county agriculture agent.

Coexisting with cranes

The crane population in the Midwest continues to grow, though at a slower rate in recent years. As the birds expand their range and explore new habitat, more farmers will encounter cranes in their fields. By treating corn seeds with the anthraquinone biopesticide bird repellent, farmers can tolerate the presence of sandhill cranes in their fields without fearing crop loss. With corn off the cranes' menu, farmers may even benefit from cranes eating soil insect pests.

Resources

International Crane Foundation
(Baraboo, WI)
Field Ecology Program:
(608) 356-9462; Jeb Barzen (ext. 125) or Anne Lacy (ext. 146)

University of Wisconsin-Madison
Department of Entomology,
Field and Forage Crop Entomology Program:
Dr. Eileen Cullen (608) 261-1507

University of Wisconsin-Extension
County office and agricultural agent locator: www.uwex.edu/ces/cty

Arkion Life Sciences (Avipel manufacturer; New Castle, DE)
Avipel seed treatment:
Ken Ballinger
(800) 468-6324;
www.arkionls.com/crop-seed.htm

USDA APHIS Wildlife Services
Waupun District Office:
(800) 433-0663 (Wisconsin wildlife crop damage questions south of Marshfield)

Rhinelander District Office:
(800) 228-1368 (Wisconsin wildlife crop damage questions north of Marshfield)

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