

Birds

(George M. Linz and Jim Hanzel)

Sunflower, due to the easy accessibility and high nutritional value of its seed, is particularly vulnerable to damage by birds (Figure 101). Seeds are exposed and the large head serves as a perch during feeding. Sunflower seed is a preferred bird food because the seed contains many proteins and fats essential to their growth, molt, fat storage and weight maintenance processes. Although many species of birds feed in maturing sunflower fields, the greatest losses are caused by migrating flocks of red-winged blackbirds, yellow-headed blackbirds and common grackles (Figure 102). Significant losses can occur in fields near cattail marshes.



■ Figure 101. Sunflower may be depredated by birds. Birds perch on sunflower heads and pluck the seeds. (Reu V. Hanson)

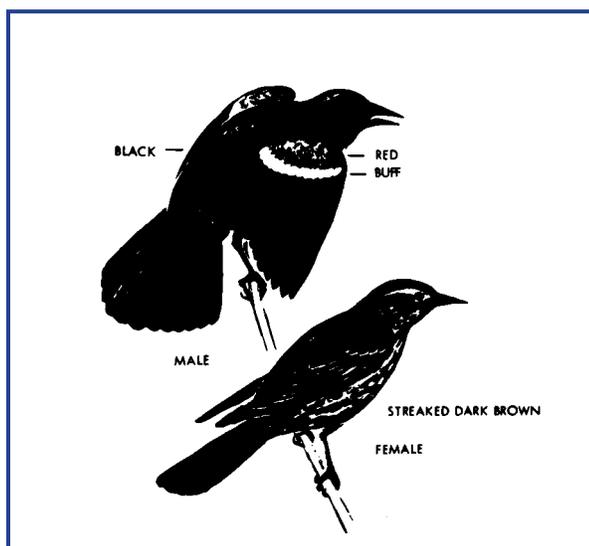


■ Migrating and Feeding Habits of Blackbirds

The adult male blackbird is the first of his species to arrive in the spring. He establishes a territory and awaits the arrival of the females. As females arrive, they disperse to the males' territories and breeding takes place. Each female produces a clutch of three or four eggs. Nests are built in dense vegetation, most often in cattails, which have an abundant food supply. Their diet throughout the nesting season includes insects, weed seeds and waste grains.

Following nesting in July, blackbirds form large flocks and begin feeding in grain fields. Blackbirds start feeding on sunflower seed soon after the petals begin to wilt and cause most of the damage during the following three weeks. Peak concentrations of blackbirds occur in mid-September in the northern growing area (Figure 103). This period coincides with the time that sunflower nears physiological maturity. Most often, the birds roost in the cattail marshes at night and move to the field for feeding during the day.

Blackbirds feed on insects and weed seeds in small grain, corn or sunflower fields before these crops are vulnerable to damage. They become used to feeding in a certain location and include sunflower seeds in their



■ Figure 102. The red-winged blackbird is the most serious bird pest of sunflower in the northern Plains. (Reu V. Hanson)



■ **Figure 103. Blackbirds cause the most damage in early to mid-September.** (Reu V. Hanson, George Linz)

diets as the crop matures. Efforts made by the producer to move birds from a field often are unsuccessful because the birds are in the habit of feeding there.

Management

Blackbirds are protected under the Migratory Bird Treaty Act. However, Section 21.43, Title 50 CFR, provides: “A federal permit shall not be required to control yellow-headed, red-winged, tri-colored red-winged, and Brewer’s blackbirds, cowbirds, all grackles, crows and magpies when found committing or about to commit depredations upon ornamental or shade trees, agricultural crops... .” Cultural practices in combination with mechanical and chemical harassment practices should be used to control blackbirds.

Cultural Control

A combination of cultural practices may be used to reduce the risk of bird damage to sunflower. If possible, sunflower should not be planted near cattail marshes or woodlots. Unplanted access trails allow easier access to fields while scaring blackbirds from the center of the field. Planting should be done at the same time as neighbors because earlier and later ripening fields take more damage.

Weed and insect control should begin early. Insects and weeds in the crop are often an attractive food source for blackbirds before the crop reaches a suscep-

tible stage. Once blackbirds have developed patterns in insect-infested or weedy fields, they will begin to include the maturing cultivated crops in their diet. The plow-down of harvest stubble should be delayed until after sunflower harvest. Crop stubble serves as an alternate feeding area for harassed birds and other wildlife. Sunflower should be harvested as early as possible to avoid prolonged exposure to bird damage. Desiccation to advance harvest will reduce exposure to birds.

Cattail Management

Dense cattail marshes serving as roosting sites for blackbirds can be managed with a registered aquatic herbicide (e.g., glyphosate) to remove cattails used by these birds (Figure 104). Generally, cattails must be treated one year before sunflower is planted in the vicinity of the marsh to allow time for the cattails to decompose. However, herbicide applications made in mid-July might reduce blackbird use of the marsh in the year of application. The herbicide should be applied from mid-July to late August to at least 70 percent of the marsh with an agriculture spray plane or helicopter (Figure 105). Use 2 quarts of herbicide per acre. Managing these marshes reduces blackbird use and improves the habitat for other more desirable wildlife, such as waterfowl. North Dakota/South Dakota Wildlife Services, telephone (701) 250-4405, is a unit within the U.S. Department of Agriculture’s Animal and Plant Health Inspection Service. It operates a cost-share cattail management program in North Dakota and South Dakota.

Decoy Crops

Blackbirds can be attracted readily to small plots of oilseed sunflower or other desirable crops planted near traditional wetland and tree roost sites. This strategy can be effective for the protection of high-valued confectionery and oilseed varieties. The plots must produce sufficient seeds to feed the expected population of blackbirds. Each bird can eat about 1 pound of sunflower seeds. Thus, if a grower expects 30,000 blackbirds, then a 20-acre plot must produce about 1,500 lb/acre to feed the birds for a season. These plots also provide essential food and cover for other migrating and game birds. The North Dakota/South Dakota Wildlife Service’s National Wildlife Research Center, at telephone (701) 250-4469, is developing and refining the decoy crop concept. A cost-share program is available to sunflower growers.

Birds are kept out of sunflower fields most successfully by starting methods to frighten them as soon as the birds are seen in the vicinity, regardless of their diet. Various ways of moving birds mechanically are listed.

Use of .22-caliber Rifle

This method should be used only where legal and safe. One rifleman can protect 100 acres by firing from a high position into the midst of settling birds. Several more rounds fired into the lifting flock often will send them on their way. Riflemen must use extreme care with the use of rifles since the bullet may carry a mile or more. Sometimes good results can be obtained with this method if used consistently.



■ Figure 104. Cattails used by roosting blackbirds can be removed by aquatic herbicide (e.g. glyphosate). (George Linz)



■ Figure 105. An aquatic herbicide such as Rodeo (glyphosate) should be applied by airplane or helicopter. (James Hanzel)

Automatic Exploders (Figure 106)

Automatic exploders or bird-scaring cannons automatically detonate a gas to produce an extremely loud explosion. These devices range from relatively simple mechanisms to deluxe models with photoelectric regulators and programmable firing sequences. The device should be operated before birds begin to arrive from their roosting area at sunrise and continued as long as birds are in the field. It should be shut off at night. The exploder should be placed on a stand above the crop. It should be adjusted to fire slowly, about every four to five minutes. The exploder should be moved every two or three days, as birds will become accustomed to the noise if operated in the same location day after day. One exploder can protect 10 to 20 acres, especially if used with other mechanical devices and shooting.

Electronic Frightening Devices

Devices that broadcast distress calls of blackbirds are marginally effective and their application is somewhat limited because of their high cost and limited broadcast range. Furthermore, because they make extensive use of batteries, sophisticated electronic equipment and loud speakers, they are subject to vandalism and theft.

Pyrotechnic Devices

These include cracker-shells, flares, whistlers (fired or pistol launched) and firecrackers. Most of these products are effective in startling birds and are used commonly by many growers. These devices must be used with care, however, because of the potential for



■ Figure 106. Gas exploder, when properly located and moved within the field every 2 to 3 days can reduce bird damage. (Reu V. Hanson)

mishaps. Safety glasses and hearing protectors are strongly recommended since these devices occasionally detonate prematurely. They also may be a fire hazard during dry periods.

Shotgun

This tool is costly and ineffective as a direct control device. Killing a few birds has little if any direct effect on the rest of the flock. However, shotguns can be used to reinforce automatic exploders and pyrotechnic devices.

Airplane Hazing

Harassing feeding blackbirds with airplanes sometimes can be a marginally effective method of chasing flocks from sunflower fields. This technique is especially effective if combined with other mechanical methods, such as shotguns and pyrotechnic devices. Check with local authorities for permits needed to conduct low-level flying.

Repellents

Avitrol, a chemical frightening agent, and Bird Shield, a chemical repellent, are the only chemicals registered for management of blackbirds in sunflower. Avitrol is a cracked-corn bait in which one out of every 100 particles is treated with the active ingredient 4-aminopyridine. The bait is applied by airplane or ground vehicle along access lanes placed in fields. When a blackbird eats one or more treated particles, it flies erratically and emits distress calls. This abnormal behavior sometimes causes the remaining birds in the flock to leave the field. Bird Shield is a newly registered product that is formulated with the active ingredient methyl anthranilate. Research results to date indicate that the efficacy of both Avitrol and Bird Shield are inconsistent.

Best results are obtained by using an integrated pest management system that includes controlling insects and weeds that might attract blackbirds prior to sunflower ripening and by using a combination of harassment devices. Any device used must be operated when the birds are in the field.

Other Pests and Damage

(Duane R. Berglund)

Several sources of sunflower injury exist. Some of them are confused with damage from insects or diseases.

Rabbits

Rabbits will start foraging soon after seedling emergence, especially near the edges of fields. They will tend to concentrate on one row and apparently eat their fill, then leave until the next feeding period. Continued feeding by rabbits has been observed until the plants are 8 to 10 inches tall. Rabbit feeding on such large plants may be confused with deer. However, deer can be detected by their tracks.

Deer

Deer begin foraging on sunflower plants when the plants reach 8 to 10 inches and continue through harvest. They feed in areas near cover, such as wooded areas. All leaves of young plants will be consumed below the growing point. Heads will be foraged until near maturity and seeds until harvest. Often deer will knock down the stalk to facilitate foraging.

Gophers and Mice

Gopher and mouse damage usually is seen just after planting. It generally occurs next to overgrazed pastures, grassland recently converted to cropland and fields next to abandoned areas. The seed will be dug up, split open with the kernel consumed and the hull left on the soil. Several seeds in a row will be eaten. Seedlings are eaten occasionally when they are 2 to 3 inches tall. If the growing point is consumed, the seedling gradually dies. Shooting or rodenticide-treated oats will control gophers and mice.

Lightning

Lightning damage sometimes is mistaken for a disease. It is distinguished from disease damage by the sudden death of the plants in the affected area and the fact that both sunflower and weeds (not grass, however) are killed (Figure 107). Near the edge of the area, plants are wilted but not dead, and the stalks may have a brown to blackened pith. The area may be as large as 50 to 100 feet in diameter. The affected area usually is circular and does not increase in size after the first two weeks. Flags may be placed at the edges of the affected area to observe if the damage gradually progresses beyond the flags. If damage does gradually extend beyond the flags, this could indicate damage from a source other than lightning.

Flooding

Soils should have good drainage for sunflower production, but the crop doesn't differ greatly from most other crops. In flooded sunflower, research found that ethylene increased in the stems and roots below the water. Later, chlorophyll breakdown and leaf epinasty resulted. Sunflower plants flooded longer than three days may not recover. Cool, cloudy days during the flooding period reduce the damage, whereas hot and sunny days may hasten the death of plants.

Heat Canker

Warm temperatures and sunny days can result in heat canker injury to young sunflower seedlings growing

in black or dark, moist soils. Hot temperatures at the soil line cause cell death in the young stem and the plants will show bands of yellowing and constricting. In severe cases, the constricted area completely girdles the stem at the soil line and the plant topples over. The sunflower seedling will not recover since the growing point is above this site. Plant populations can be reduced significantly in some cases.

Frost Damage

Sunflower seedlings in the cotyledonary stage (VE) can withstand temperatures down to 26 degrees Fahrenheit when just emerging from the soil. Sunflower in the V-1, V-2 and V-3 stages become less tolerant to frost as they grow and develop. The terminal bud can be frost damaged in seedlings with two, four and six true leaves. This early frost damage and killing of the terminal bud can result in excessive branching as the sunflower grows and develops.

Sunflower is most susceptible at the bud (R-4) and pollination stages (R-5.0 to R-5.9) of development. Temperatures of 30 F or less can cause damage to the anthers and stigmas of the pollinating disk flowers. (See Figure 108 for frost-damaged sunflower head).

Sunflower has a composite type flower. Several rows of showy yellow ray flowers encircle the head and commonly are called the "petals," although each is an individual flower. The center portion of the head, and by far the greater part, is composed of inconspicuous individual flowers, one for each seed that may develop. These disk flowers mature in circles from the outside



■ Figure 107. Two spots in sunflower field damaged by lightning. (Terry Gregoire)



■ Figure 108. Frost damage in the center third of sunflower head. (Duane Berglund)

of the flower head to the center, so that at various stages, the disk flowers ready for pollination appear as a yellow circular band in the brownish or dark center of the head. These disk flowers are sensitive to frost.

The result of the frost damage in the flowering period is circular bands of undeveloped seed that would vary with individual flower heads from a band around the outside edge to an area in the center. Unopened buds are less susceptible to frost than the opened flower heads. Growers can determine the extent of injury by cutting the surface of the flower head.

Once pollination is completed and 10 to 14 days after petal drying occurs, the sunflower plants can withstand frost temperatures as low as 25 F and have only minor damage. Twenty-five degrees Fahrenheit at the bud stage often will damage the stalk below the bud and seeds will not develop. If hard frosts do occur, many times only the seed in the center of the head (the last to pollinate) will be affected.

When sunflower heads start to turn yellow on the backside and the bracts are drying and turning brown, most risk of frost damage is very minimal.

In nonoilseed sunflower, frost damage can cause quality problems by causing a dark brown to blackened nutmeat to result during the roasting process. For the birdseed market, light-weight sunflower seed and brown seeds are the result of frost damage and will be discounted.

For oilseed sunflower, reduced test weight per bushel and lower oil percent may result from a frosted immature sunflower crop.