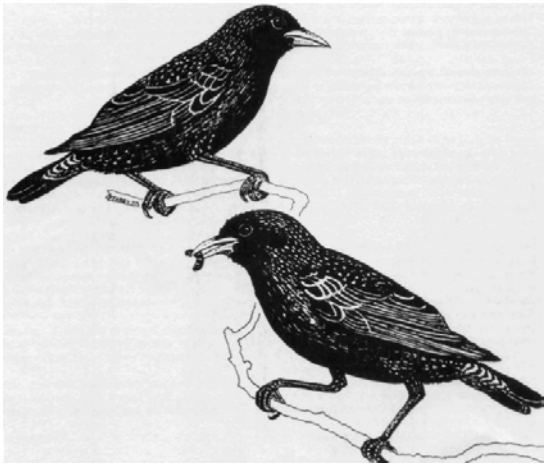
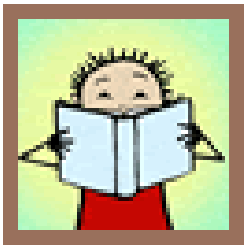
BIOLOGY, LEGAL STATUS, CONTROL MATERIALS AND DIRECTIONS FOR USE

Starling

Sturnus vulgaris

Family: Sturnidae





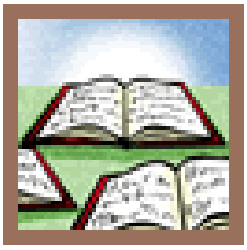
Introduction: The European Starling is an invasive species. In 1890, 100 birds were released in New York's Central Park, the North American population is now estimated at more than 200 million.

Bird control in agriculture is an age old problem. Starlings are no exception to this problem (Seamans et al 2002). Starlings damage row crops, nuts, fruit, grapes, seedling sugar beets, tomatoes, and lettuce (Gorenzel and Salmon 2000).

Identification: Smaller than blackbirds, with a short tail and pointed head and triangular wings, starlings look black at a distance but when seen closer they are very glossy with a sheen of purples and greens. Their flight is fast and direct and they walk and run confidently on the ground. Noisy and gregarious, starlings spend a lot of the year in flocks. Further information is available at:

Cornell Lab of Ornithology

The Royal Society for the Protection of Birds

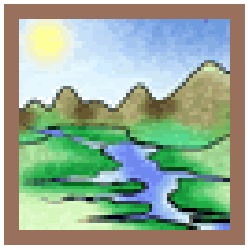


Legal Status: The California Fish and Game Code defines starlings as a nongame bird that may be taken and possessed by any person at any time. There are no federal restrictions on taking starlings.

Damage: Damage can be seen in grapes, figs, peaches, cherries, apricots, olives, strawberries, nectarines, plums, prunes, apples, persimmons; grain in newly seeded fields; and in cattle feedlots, dairies, and poultry ranches.

Range: Resident throughout lowland California. These residents are joined by large flocks of migrants from the northern states in autumn and winter.

Starling

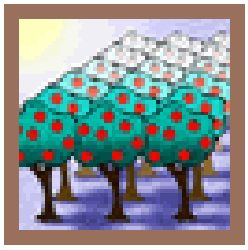


Habitat: Farms, ranches, open country, open groves, fields, cities, and more open forest and scrub.

Biology: About mid-September, migrants from as far north as British Columbia begin arriving in California. They merge with residents into large flocks which are found in and around animal feedlots, scattered over pasture and rangeland, or in vineyards feeding on insects and mummified grapes left after harvest. By mid-March these birds have either paired off to nest or have migrated from California.

The nest is built in any tree cavity, hole in a building, or deserted woodpecker hole of suitable size. Nests used in successive seasons become foul-smelling. Two to eight eggs are laid, usually four to six. The incubation period is 11 to 13 days; both sexes assist in this activity. Age at first flight is 19 to 22 days.

As fledglings come off the nest they gather in small family groups of up to ten birds, including one or two adults. These small groups eventually merge together until large flocks are formed. Merging continues until all of the birds in a local area are in one large flock. These flocks are scattered throughout the state in summer and are responsible for depredations to soft fruits and other summer crops. Population build ups in cattle feedlots begin by mid-October. Starlings share a communal roost at night and, during the winter, as many as 5 million birds have been observed in one cattail and tule roost. The starling's diet is almost 60 percent animal matter; mainly insects and other small invertebrates. Vegetable matter is largely berries and other fruit with some seeds and grain. Losses from starlings in feedlots result from fecal-transmitted dysentery in the cattle as well as the value of rations consumed.



Damage Prevention and Control Methods

Exclusion: Exclusion from nesting sites is possible. Close all openings larger than 1 inch to exclude starlings from buildings and other structures and provide a permanent solution. In farm-like settings heavy plastic or rubber strips hung in open doorways of buildings have been successful in excluding starlings while still allowing people and machinery to pass through doorways. Hang 10 inch wide strips no more than 2 inches apart.

In California, plastic netting has proven itself as an option to protect vineyards, orchards, or fruit crops (Taber 1998). Weigh the cost of netting against the destruction of crop. Efficient mounting can be achieved using tractor-mounted rollers to facilitate installation and removal of netting draped directly over vines. Taber (1998) reports success where Canadian vine growers mount netting strips vertically to cover the fruit bearing portion of the vine only.

Habitat Modification

Airports: Starling flocks near airports are a known hazard. Researchers report that airside vegetation should be kept between 5 to 10 inches to reduce starling or similar bird activity (Barras et al 2000).

Livestock: Starlings are attracted to the food and water on offer at livestock operations, particularly during the winter months. Limit the availability of food and water wherever possible for effective long term starling control. For example, the following practices, individually or together can reduce both ration loss and disease transmission:

1. Maintain a clean policy. Clean feed spills.
2. Store all grains and feed in bird proof containers (sealed).
3. If possible, use bird proof livestock feeders. Flip tops, magnetic, or automatic release type.
4. Alternatively, feed in covered areas where possible.
5. Use feed larger than the starling can digest. For example, cubes or blocks larger than ½ inch.
6. Starlings prefer to feed morning to midday. Stagger feed schedules where possible. Consider feeding at night.
7. Starlings are attracted to water. Control water levels in livestock water troughs so starlings cannot access easily. Drain unnecessary water pools.

Frightening Devices: Propane cannons or exploders, alarm and distress calls, shell crackers, bird bombs®, and bird whistlers® are used in dispersing starlings from crops. These devices should be used as soon as the birds appear; delays will make bird removal more difficult. A combination of two or more different sounds is often needed to move the birds out of the crop.

The cannons or biosonic units should be mounted on stands or telescoping tripod towers above the crop. The units should rotate so the sound is projected over a wide area. Field observations will determine the location where the units should be placed, the number of units to use and how often they should be moved.

Fumigants: Fumigation is not practical for starling control, and no fumigants are registered for this purpose.

Repellents: For the most part, repellents are of no value in agricultural situations: Washburn et al (2006) evaluated propane exploders at airports; Seamans et al. (2006) the Chromaflair crow buster; and Beason (2004) acoustic devices. Askham (1996) demonstrated that disaccharide (sugar) intolerances did not work as a control method.

Sticky repellents, mechanical barriers, etc., may be effective when starlings are roosting on buildings or structures.

Trapping: Modified Australian crow traps (Gadd 1996) and converted cotton trailers have been effective for capturing large numbers of starlings in California. A cotton trailer may be converted to a large mobile trap by constructing an entrance on top and plugging all escape holes. In some instances the slot entrance has proven more effective, while at other times the wire entrance was more successful. The location of the trap is important. Observations should be made to determine starling flyways, resting or perching areas and feeding areas before the traps are placed in operation. These traps have been most effective when placed in the open near, but not necessarily under, perching or feeding areas.

When a trap is first installed, the bottom should be checked to see that an uneven ground surface does not leave holes that birds can escape through. It may be necessary to use a chicken wire bottom to prevent the entry of predators or ground squirrels. Starlings can escape through holes dug by squirrels. Trap baits that have been used successfully include cull peaches, other soft fruits, raisins, and poultry pellets. Bait placed on the ground inside the trap in large amounts with a little on the top near the entrances is most effective. Bait materials that the birds feed on in the area should be used for best results.

The use of live decoy starlings is usually essential in attracting birds to the trap. Five live decoys are sufficient for the modified crow trap and up to fifteen for converted cotton trailer. Food, water and shade must be supplied at all times. Starlings will die rapidly without water in warm weather. The traps must be kept clean and dead birds removed.

Trapped birds can be removed through a small exit hole which has been cut into the upper corner of the rear of the trap and covered with a closeable door. A small holding cage can be placed over the hole and the starlings herded into this cage. Euthanize with CO_2 for a bottle. The birds should be disposed of by burying or in plastic bags in the trash.

Shooting: Shooting is costly and rather futile as a method of crop protection because of the typically large number of starlings causing depredations.

Bait: Bait materials have included poultry pellets, raisins, cherries, fresh grapes, dried apples, rolled milo, barley, and corn, and mealworms.

Toxicants
Avitrol - 0.5% Mixed Grains

A fright producing chemical prepared on grain bait for use by public agencies and licensed pest control operators qualified in bird control. Use according to label directions.

Directions for Use

General Procedure: Before exposing treated baits, thorough observations should be made to determine the number of starlings present, their feeding habits, preferred locations, daily behavior patterns, and the presence of nontarget species. Observations should continue throughout the day. During these observations, desirable locations for bait exposure should be selected. If adequate precautions are taken in selecting baiting sites no other species should be harmed.

When the daily activity pattern of the birds has been established and baiting locations selected, clean bait should be used to determine the preferred bait. Prebaiting should continue for several days or until there is good bait acceptance. Toxic bait should not be exposed until good acceptance of clean bait occurs. Bait should be applied only under the supervision of the agricultural commissioner. Allow only responsible adults to place bait.

Starling Control at Animal Feedlots: When the daily activity pattern of the birds has been established and baiting location selected, clean bait should be exposed to determine the bait preference. Rolled milo, barley, and corn, raisins, and fresh grapes have been found to be best accepted baits. Usually the grain in the cattle ration will be the preferred bait, although at times raisins or fresh grapes have been well accepted.

When the preferred bait has been determined, treated bait should be exposed at the selected feeding locations.

Several methods of bait application may be used. The material may be "stripped" down feed alleys, placed in V-troughs at selected locations, placed in troughs attached to the outside of feed bunkers, or broadcast thinly in alleyways and pens if weather permits.

Observations must be continued throughout the program. Poor acceptance may be due to a change in bait preference.

Baiting should be continual until control is achieved. This may be for a considerable period of time or for a few days, depending upon the number of birds present and the rate of movement of new starling populations into the feedlot.

Baits will lose their toxicity in rainy weather. This loss can be reduced by treating the bait with a lard or tallow coating.

In some instances, the use of modified Australian crow traps or cotton trailers converted to starling traps can provide control at small feedlots. Bait trays may be attached to the traps.

Control of Starlings in Orchards and Vineyards: Control of starlings in orchards and vineyards can be accomplished using traps and bait stations. Expose treated bait at bait stations with caged live starlings. Damage can also be reduced through the use of frightening devices and recorded distress calls.

Trapping can be used to reduce starling populations. The most effective traps are modified Australian crow traps or cotton trailers converted into larger traps. Traps and bait stations are most effective when utilized in organized control programs supervised by persons experienced in starling control procedures. Using them early in the season when juvenile birds are first observed can reduce local populations and less damage will occur when fruits ripen.

The first fledged starlings of the year leave the nest in April and soon gather into small family groups of up to ten birds, which include one or two adults. At this time, the adults teach the fledglings how to feed

themselves. As the summer progresses these small family groups band together and form larger flocks. This continues until all young starlings in a local area gather into one large flock.

Trapping or the use of toxic bait in areas where these flocks are building up can effectively prevent heavy crop damage. Placement of the traps and bait stations is of prime importance and should be supervised by personnel experienced in starling control. The exposure of toxic baits should be under the supervision of the county agricultural commissioner.

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