COMMERCIAL PEST MANAGEMENT OF BIRDS IN GRAPES

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ABSTRACT: Vineyard losses to birds are primarily due to two species; these are the starling (Sturnus vulgaris) and the house finch (Carpodacus mexicanus). The majority of losses in the Central California Coastal region are caused by the starling, due to the large numbers of migratory birds arriving prior to harvest. Starlings are best controlled by a combination of pyrotechnic and acoustic devices. Linnets are most effectively controlled by trapping and poisoning. No matter what type of control is used, it is necessary to have sound knowledge of the birds' behavior and reliable personnel carrying out the program. An effectively run program can reduce losses by as much as ninety percent.

INTRODUCTION

For a bird to be a problem of adequate importance to be commercially controlled, it must cause at least enough damage to equal the cost of control. There are two major species of birds in Central California which fall into that category, the starling and the house finch. These two species can cause major damage to vineyards, and in areas with a past history of substantial loss, money spent on control of these bird species is very worthwhile. These birds are not the only birds which will damage grapes; however, they are the two which, by far, cause the greatest loss of fruit (DeHaven, 1973).

STARLINGS

Number one on the list of vineyard pests is the starling, primarily because it can cause the greatest loss in the shortest time period. Most growers rate the starling as the worst pest because of the tremendous psychological effect created by the denuded grape clusters left in the path of a large flock. Starlings are attracted first to the exposed bunches on the top of the vine (Boudreau, 1972). These same bunches are in full view of the vineyard operators, so they are usually aware of starling losses, and can easily associate them with their large, rather ominous flocks.

The flocks which arrive in Central California around the middle of October can number in the tens of thousands. It can be extremely upsetting to a vineyard owner to know that there are several thousand starlings only a couple minutes flying time from his grapes. These large flocks are often visible up to several miles away, so the threat of invasion is always there.

Another factor which makes the starling economically important as a pest species is its high food requirement. A starling goes through a complete digestive cycle about every thirty minutes. They have a high metabolism and a relatively inefficient digestive tract. These two factors coupled with the increased energy needed to maintain body temperature during cold, windy weather lead to a high food intake. This means that starlings are feeding practically all day long. A bird as numerous as the starling, with its high food requirement, is something well worth controlling.

The starling rates high in intelligence when compared with other birds. His intelligence to man is reflected primarily by his adaptability to the methods used in control. This bird learns the difference between a direct threat and something which presents little danger very rapidly. They quickly learn the effective range of a twelve gauge shotgun, and they will learn that an acetylene cannon poses little threat in a matter of a week if it is simply placed in one spot and used as a noisemaker. Never underestimate the starlings' ability to adapt. If they are exposed to the same alarm stimuli incessantly, the noises cease to be strange and the birds learn to ignore them (Boudreau, 1975).

One problem that develops with starling control concerns the large flocks breaking up. Mainly, this occurs with the winter flocks that number four or five thousand which are broken up into numerous smaller flocks numbering in the hundreds of birds. This usually occurs because they are hard pressed by bird control personnel. When this happens the vineyard will receive pressure at many different locations from the smaller flocks instead of primarily one area from a single large flock. The smaller flocks of birds are much more

difficult to spot as they are trying to enter a vineyard. These smaller flocks are also much more difficult to work with because they are more persistent and do not generally respond as well to control techniques. A certain small percentage of starlings are extra sensitive, and the larger the flock the more extra sensitive individuals it will contain. Also, when a large flock is broken up into smaller segments it requires more manpower and greater equipment expenses to keep the increased number of flocks away. Frequently there will be problems caused because more personnel may not be immediately available, and if this is the case, some damage may occur. The best means to avoid breaking up a large flock is to harass it less severely and from a greater distance than you would a flock of only a hundred birds. This will keep the flock together and yet still be adequate to drive the birds from the protected areas.

One problem that is present with the control of any bird is their tremendous mobility. Starlings can be chased from a vineyard until they are out of visual range only to appear again on the other side of the same vineyard five minutes later. Frequently, I have chased persistent birds from one end of a vineyard to another. This may continue for a half hour or longer, until the birds desire for grapes is overruled by their expenditure of energy. At this time they generally retire to some refuge point a half mile or more away. While there they generally feed on some other form of food or possibly just loaf until they feel it is safe to make another attempt to feed in the vineyard.

Most vineyards are not set up with adequate roads for the optimum amount of access needed for the most effective bird control. The shortest distance between two points is a straight line, which is the route taken by the starling. We, being only human, are forced to stay on the roads. With the starling flying at up to fifty miles per hour, personnel are sometimes forced to travel at high speeds to intercept them. Also, the mud created by Fall rains has little effect on the starlings mobility. These rains, however, can cause personnel to travel at very slow speeds or even become stuck. This allows the starlings to become habituated to feeding in the vineyard and they are quick to take advantage of any promising situation. This situation can be helped considerably by equipping vehicles with "mud grip" type tires or having four wheel drive. In areas that are particularly hilly or steep, a four wheel drive vehicle may be a necessity for adequate mobility in wet weather.

One problem that commercial controllers run into consistently involves the starlings who become habituated to the vineyard before the grower can be convinced that the control program should be started. Because the grower makes the final decision on the length of the control period, bird personnel often have to wait too long before starting operations. The growers like to keep the costs of a program down by waiting as long as possible after the grapes become attractive to the birds before starting controls. It is difficult to convince them that the programs are more efficient and would cost less in the long run if they were started at the first signs of the bird damage. It takes less than a week for starlings to become habituated to a vineyard, and once this happens greater losses will occur before harvest.

One behavior trait that is an advantage in control of the starling is their extreme wariness to danger. Danger to a starling may be presented by many different forms. In the vineyards, danger is most often represented by the presence of man. Flocks of starlings have learned to avoid humans who get closer than a certain distance. The starlings flushing distance is the distance between the person (stimuli) and the flock when the birds take to the air. The flight distance is the distance that the birds fly away from the person before they alight again. There are several factors which affect this, primarily the distance to escape cover, intensity of the stimuli, and the frequency that the birds are exposed to the stimuli. Starlings have a relatively long flushing distance and a long flight distance, especially if they are effectively harassed by man.

Another advantage of control is the high visibility of a flock of feeding starlings. A flock that has just entered a vineyard and begins their characteristic "swarming" feeding pattern can be spotted at up to a mile. Many times a small portion of the flock will remain perched on a nearby tree or powerline, and these birds can help an experienced observer detect a flock. Alert personnel can intercept them in a very short time and drive them away.

Flocks of starlings will exhibit a certain similarity of behavior when entering a vineyard that can be put to good use by bird control personnel. New birds which are unaccustomed to the area will generally perch on a powerline or in a tree to look things over before sampling different varieties. These birds can be easily spotted by control

personnel and driven from the area. Starlings which have fed in a vineyard before will tend to feed in the same area consistently because they have already determined where the most palatable grapes are. Therefore, in any one vineyard there will be certain spots that the birds enter and feed at frequently. By spending a greater amount of time in these spots, control personnel can effectively cover more acreage. Time spent patroling areas with infrequent visitation by starlings is time which could be put to better use.

Once a flock of starlings is allowed to form a consistent feeding pattern in a vineyard it can be broken only by much persistence. After a lot of pressure is put on the birds they will change their tactics by feeding in less desirable locations. They will also start feeding in areas where they are more difficult to detect.

Instead of approaching the vineyard in the characteristically dense, closely formed flock at a high altitude, pressured starlings will frequently approach in a very scattered stream only several feet above the ground. This makes it much more difficult to intercept the flock before they reach the vineyard. Birds using this tactic are generally following a "hit-and-run" type feeding schedule. They are attempting to get a few extra minutes of feeding time in through avoiding early detection by control personnel. This is only found in areas where birds are highly pressured and the starlings are changing tactics in order to get longer feeding periods.

STARLING CONTROL TECHNIQUES

The list of items that have been used to try to control starlings is quite large. The vast majority of these items are very ineffective. They may have a desirable effect on the flocks for the first couple of days, but the birds quickly become inured to them.

Several of these devices, if used properly in an integrated program, are very effective. The program that we generally use for starling control involves the use of biosonics, crackershells, and automated gas exploders. The most important thing to remember in any starling control is the need for integration of control methods. In other words, relying on more than one item or method for control (Anonymous, 1975). The emphasis that we put on the use of any one item changes from week to week and is constantly being re-evaluated. Trapping starlings by means of modified Australian crow traps and poisoning from baited trays can be of help in a control program. This operation, however, must be carried on at some spot outside the vineyard where the birds spend a considerable amount of time (Clark, 1967).

These control methods are supplemented by good personnel and lots of persistence. It is difficult to overemphasize the necessity of having intelligent, dependable personnel. The nature of bird control gives personnel much freedom of choice; and you must be sure that the men are consistently on the job. Starlings are quick to adapt to the habits of someone who consistently arrives late in the morning or who takes his lunch break at the same time every day. Effective bird control is a seven day a week, sunrise to sunset, job. It takes a very dedicated employee to follow this type of schedule over a ten to twelve week period.

LINNETS

The California House Finch or Linnet is a common native bird throughout California. It is generally found in fairly small flocks that are not particularly noticeable to the average observer. It is rarely found in any great concentrations, in comparison to some other pest bird species, since it is nonmigratory. These small, rather nondescript birds can cause severe damage to both table and wine grapes. Generally, flocks of from five to thirty birds are found in the vineyards. These small flocks of birds cause damage in a somewhat subtle manner. They simply pick here and there, all day long, and by harvest there is a considerable amount of damage. The grower does not see any large, ominous flocks of birds descending on his crop and leaving only stripped clusters in their wake. There is just the constant presence of small birds feeding in the vines. Many growers don't even associate the damage with the linnet; they even mistake its activities as beneficial feeding on insects.

The linnet is a very difficult bird to scare. It has both a very short flight distance and a very short flushing distance. In other words, you can closely approach a linnet, and when it finally flies it only goes a short distance. It does not respond well to the harassment techniques that are effective on the starling. As soon as a linnet gets thirty

feet up in a tree or on some power lines, it feels quite safe. Also, the linnet population in a vineyard will be spread over a major portion of the acreage. Attempting to scare away birds which are widely dispersed and which have a short flushing distance and flight distance would require more effort and expense than the savings in fruit would warrant.

LINNET CONTROL TECHNIQUES

The most practical and economical way to control linnets is by a combination of poisoning and trapping (Piper and Neff, 1935). The same characteristics that make the linnet a difficult bird to scare make him a good candidate for poisoning. A linnet will usually ignore a dead brother in the trough only a foot away. Poisoning by means of troughs is a method that will knock down a concentration of linnets very rapidly. It is a lot of work, but it yields big rewards if the birds are concentrated. However, if you are dealing with a population of birds that is spread over a large area, a better catch per unit effort can be obtained by trapping. Linnets respond well to proper trapping techniques. In fact, I have caught up to a hundred birds a day in a single, well-located trap. This, however, is far above the average catch. Trapping success depends largely on proper placement and maintenance of the traps. A poorly maintained and placed trap may catch less than one bird per day. It only takes about fifteen minutes per trap per day to keep them in top shape.

Since linnets are nonmigratory, a year-round trapping and poisoning program can significantly reduce the numbers of birds in the area around a vineyard. A total eradication program would not be feasible or necessary. There is a point in any bird program where the cash outlay for control does not equal the reduced damage.

ECONOMICS OF CONTROL

Money spent on a bird control program can be an excellent investment for the grower. Every dollar spent on good professional control will yield many dollars back in fruit that would normally be lost. One vineyard in the Gonzales, California, area is an excellent example. In 1973, on one hundred and forty acres of young vines there was an estimated crop of fifty tons. The growers initiated their own control program to attempt to keep the starlings and linnets from damaging the crop. When the grapes reached about twelve percent sugar content, a very large flock of starlings started feeding in the vineyard. In a period of three weeks the birds consumed forty tons of the crop. The grower was forced to harvest ahead of schedule so that they could at least get some grapes from the vineyard. The market value of the crop lost was $18,000.00. The value of grapes lost per acre was $128.00.

In 1974, the grower enlisted a commercial company to conduct bird control on this vineyard. When the grapes were harvested in late November, an assessment was made of the total damage present. With commercial control procedures the grower was left with ninety-five percent of his original crop. That means that he lost five percent with the commercial program and eighty percent with his own program. If the grower would have initiated the commercial program in 1973, he would have saved over one hundred dollars per acre even after paying for the commercial program. That is a tremendous savings to the grower, especially if you consider the quantity that would have been lost in 1973, if the grapes were allowed to become fully ripened and sweet on the vines.

The costs of linnet control are considerably less than those of starling control, however, the linnets cause a proportionately smaller amount of damage. Generally, the grower will get back between two and five times the cost of the program in increased crop yields.

CONCLUSION

Effective control of bird depredations in vineyards is possible if a thorough knowledge of the birds' behavior is coupled with an integrated program carried out by intelligent, dependable personnel. Both starling and linnet damage can be kept to subeconomic levels by a proportionately small investment in a well-rounded control program.

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