CHAPTER 9

VERTEBRATE MANAGEMENT

LEARNING OBJECTIVES

After completely studying this chapter, you should:

- Know the biology and types of damage caused by vertebrates in fruit crops.
- Be able to determine when it is necessary to apply management options.
- Understand the control options available to manage each vertebrate pest.

INTRODUCTION

Vertebrates rarely cause the extent of damage that insects, diseases, weeds and weather can cause in an orchard or small fruit field. In some situations and locations, however, they can pose significant problems. Management of vertebrate pests is complicated by the following factors:

- **Range.** Many vertebrates have home ranges that cover very large areas. They may use the orchard or fruit planting for food, but they may seek shelter and protection in another area where control measures are not possible.
- **Unpredictability.** Many times vertebrates cause no harm or are beneficial to the ecosystem. Under certain circumstances, however, changes in weather, population size, sources of food and other conditions can cause vertebrate damage in fruit plantings to increase dramatically.
- **Public perception.** People generally have a much higher regard for vertebrates than for insects or fungi. As a result, any management plan needs to address social and political issues.
- **Legal status.** Many federal, state and local laws protect vertebrates. Permits are required to use hunting, trapping or pesticides to deter or prevent damage from most vertebrates. Exceptions are rodents such as rats, mice, voles and chipmunks, and some birds.
- **Management options.** Integrated vertebrate management usually focuses on methods that do not kill, harm, capture or trap animals — e.g., frightening devices, such as noisemakers and scarecrows; and exclusion devices, such as fences or screening.

Three of the most common vertebrate pests in orchards and small fruit plantings are birds, voles and white-tailed deer.

BIRDS

Several species of birds — including starlings, robins, house finches, cedar waxwings and blackbirds — can cause serious damage to fruit crops. In some situations, more than half of a blueberry crop can be consumed by birds.

Many laws and regulations protect birds. Non-lethal bird management methods such as habitat modification, exclusion, and scare tactics and noise devices do not require permits and are the preferred control choices in fruit. The federal Migratory Bird Treaty Act protects all birds except pigeons, house sparrows and starlings. However, local ordinances and state laws may protect these species and/or specify the types of treatments that can be used. **ALWAYS** check local and state laws before attempting to kill or trap birds.

Damage: Birds eat and damage fruit. Many birds naturally forage for berries and find commercial fruit plantings a convenient source of food. Yield loss from bird feeding can be significant in small fruit plantings.

Management Options

Exclusion

Netting is the most effective method for controlling bird damage. The netting is placed directly over plants or bushes or over a frame. The main disadvantages of this method are the high initial cost, the time and labor involved, and the inconvenience of working around it. Its effectiveness in protecting the fruit crop usually makes the disadvantages tolerable. If carefully removed and stored, netting can last for several years.

Scare Tactics and Frightening Devices

The use of frightening devices can be effective in protecting crops from flocks of feeding birds, but their use also requires hard work and long hours for the grower. Devices need to be employed in the early morning and in late afternoon when the birds are most actively feeding. In addition, birds tend to adjust or adapt to frightening devices. It is usually best to use two or more devices or methods of bird control. Frightening devices may be auditory or visual.

Auditory frightening devices: Broadcasts of recorded distress or alarm calls have been used successfully with birds. Most calls are species-specific, so it is important to identify the birds causing damage. Noisemakers such as cannons, exploders and sirens work best if used at irregular intervals and moved frequently. These noise devices do not injure birds but may be disturbing to nearby neighbors.

Visual frightening devices: Visual devices may include eye-spot balloons, scarecrows, reflecting streamers, aluminum pie tins and others. Visual devices are most successful when they are combined with sound devices. They should be rotated and moved often so the birds do not learn that they are harmless.

VOLES

Voles (*Microtus* spp.) are sometimes called meadow mice or field mice. Three species — meadow voles, pine voles and prairie voles — damage fruit trees, Christmas trees, ornamental trees and shrubs, and grassy areas throughout the state. In general, they are compact brown or gray rodents with stocky bodies, short legs and short tails. Voles are active day and night year round. They do not hibernate. They most commonly breed in spring and summer but can breed throughout the year. Voles are very prolific and capable of huge population increases. These increases, followed by dramatic crashes, are characteristic of voles. Population levels generally peak every two to five years, but these cycles are not predictable.

Meadow voles are found statewide and make shallow (1- to 3-inch) tunnels in the soil and surface runways in the grass. They also girdle tree trunks in fall and winter, particularly in years with heavy and prolonged snow cover. Pine voles occur in scattered populations in the west half of the state and dig deep tunnels but make few surface runways. They need a certain amount of organic matter and clay content in the soil so their tunnels can hold up; as a result, they are rarely found in sandy locations. If they are present, it will be in areas with heavier soil. They girdle tree roots, sometimes as deep as 3 feet. Prairie voles are found in southwestern Michigan, and the evidence of their presence resembles that of both meadow and pine voles.

Damage: Voles may cause extensive damage by girdling seedlings and trees and damaging roots. Much of this damage occurs during the fall and winter when other food sources are scarce.

Management Options

Biological

A variety of wild animals feed on voles: hawks, owls, crows, ravens, weasels, foxes, coyotes, bobcats, raccoons, skunks, shrews, domestic cats and some species of snakes. Of these, the hawks and owls (raptors) and snakes can be encouraged to feed in orchards, tree plantations and grassy areas. Predation will not prevent large, periodic increases in vole populations but may eliminate enough individuals in normal years to prevent some damage.

Habitat Modification

Reducing or eliminating grasses and other cover is one of the best long-term options for controlling voles. Mowing and maintaining the height of ground cover between 3 and 6 inches will limit food and cover and expose the voles to predators. Long mowing intervals and mowing with a sickle-bar mower can produce a thatch layer that provides cover for voles. Flail or rotary mowers are preferred. Vegetation-free zones under the trees will discourage voles from living there. Mulch, prunings or decaying vegetation should not be allowed to accumulate around the bases of trees or in tree rows.

Exclusion

The trunks of fruit trees can be encircled with tree guards to prevent voles from gnawing the bark. This is particularly important on young trees, where small amounts of gnawing can severely damage or kill the tree. It should be noted that some tree guards will become tight around the trunk as the tree grows in diameter. A tree guard that is tight to the trunk through the fall will render that trunk more susceptible to winter injury. This is especially true with stone fruits. Removing the wraps in August and letting the trunk harden off can minimize any problems resulting from tree guards. The guards can then be reapplied just before winter sets in — late October or early November in northern Michigan.

Trapping

Trapping is not effective for controlling large vole populations but can be used for monitoring or controlling small populations. Mousetraps baited with peanut butter, oatmeal or apple slices can be placed perpendicular to runways or tunnels.

Repellents

Repellents using thiram (a fungicide) or capsaicin (the "hot" in hot peppers) as an active ingredient are registered for voles. These products may afford short-term protection, but their effectiveness is uncertain. Check with the Michigan Department of Agriculture for availability.

Rodenticides

When used in conjunction with other methods, rodenticides are an important component of a vole management program. They are the easiest and most effective way to control a large population. Broadcasting toxic baits to grassy areas can be done after harvest is complete (from September to December). It is best to broadcast baits just prior to three or more days of relatively warm, dry weather, when the voles will be most actively feeding. Do not place baits in piles or on bare soil. Research has shown that bait in piles or on bare soil is least effective in killing voles and most hazardous to non-target wildlife and pets. When voles invade an orchard by traveling under snow or when ground vegetation is sparse, bait-dispensing stations should be used. Bait stations can also be used in orchards that have a history of vole injury in just certain hot spots near the edges.

WHITE-TAILED DEER

The white-tailed deer (*Odocoileus virginianus*) is an important economic and aesthetic resource in Michigan. Each year the positive economic value of deer is realized through license fees and hunter and vacationer expenditures for food, transportation and equipment. Unlike moles, rats, voles and other rodents, deer can not be casually eliminated when in conflict with humans. Control methods are built around effective deer herd management. Deer are protected year round in Michigan except during the legal hunting season. When deer are causing persistent or severe damage, however, special permits may be issued to shoot deer at other times.

The home range of deer varies, depending on season, habitat, sex and individual characteristics, but it can be as large as several hundred acres. Most individuals use the same home range year after year. They usually use one part of the range as the feeding area and another part for resting. The orchard may be the feeding area and the adjacent woods, the resting area. Deer feed year round, but the most serious damage in orchards usually occurs in the winter when other food sources are scarce.

Damage: Deer browsing on terminal buds and fruit buds in the winter can result in stunted or mishapen growth, lower fruit production, reduced vigor or even tree death. Dwarf, semidwarf and young standard trees are the most susceptible. In the summer and fall, deer may consume fruit. White-tailed deer lack upper incisors and leave a jagged or torn surface on twigs and stems that they browse. Rubbing their antlers on trees can result in broken limbs, girdled trunks and sometimes dead trees.

Management Options

Exclusion

Fencing is often the most effective way to minimize deer damage, especially in areas where the deer populations are large. In general, fencing is expensive. Gather as much information as you can in determining what type of fence to install. **Woven-wire fences** provide excellent year-round protection from deer. They are long-lasting and easy to maintain but also very expensive. Permanent high-tensile electric fencing can provide year-round protection from deer. Electric fences work by changing the behavior of the deer. Several configurations are available. Though these fences cost less than the woven-wire fences, they require frequent monitoring, maintenance and vegetation control.

Repellents

Repellents can be one component of a deer management program that includes several types of repellents, fencing and hunting. Variable effectiveness, short activity, and high maintenance and cost over the long term limit their usefulness as stand-alone measures. Repellents are described by mode of action as "contact" or "area." Contact repellents work by taste and are applied directly to the plants, usually during the dormant season. In general, they should not be used on plant parts intended for human consumption. As always, carefully read the label to confirm that the product can be used on your crop. Examples include hot pepper sauce, thiram and putrescent egg solids. Area repellents repel by odor. They are usually less effective than contact repellents but can be used in perimeter and other situations where contact repellents cannot. Examples include putrefied meat scraps (tankage), bars of soap and human hair.

Hunting

Effective use of the legal deer hunting season can be a good way to control deer populations. Shooting permits may be issued for the removal of problem deer where they are causing damage at other times. Contact the Michigan Department of Natural Resources for special permit information.

White-tailed deer.

CHAPTER 9

Review Questions

Chapter 9: Vertebrate Management

Write the answers to the following questions and then check your answers with those in the back of the manual.

1. List five factors that complicate the management of vertebrate pests.

2. Which of the following bird management methods usually requires permits?
   A. Habitat modification.
   B. Exclusion / netting.
   C. Shooting.
   D. Visual scare tactics.

3. Which of following is NOT a disadvantage of netting for bird management?
   A. High initial cost.
   B. Inconvenience to work around.
   C. Time and labor.
   D. Special permits required.

4. Recorded distress or alarm calls for bird management:
   A. Work for all birds.
   B. Are species-specific.
   C. Require federal permits.
   D. Are ineffective.

Match the following vole management methods to the appropriate examples.

A. Biological
B. Habitat modification
C. Exclusion
D. Toxic baits
E. Repellents

_____ 5. Tree guards that prevent voles from gnawing the bark.

_____ 6. Mixed grains or food pellets treated with poison to reduce populations of rodents.

_____ 7. Devices or chemicals that irritate one or more of the senses of an animal and cause it to change its behavior.

_____ 8. Placing nesting boxes for kestrels and perches for hawks and owls in or near an orchard or small fruit planting to attract predators.

_____ 9. Reducing or eliminating grasses and cover.

10. Which of the following is NOT a characteristic of voles?
    A. Capable of large population increases.
    B. Active during day and night.
    C. Hibernate during winter.
    D. Populations peak and crash.

11. Lethal controls that affect non-target species should never be used unless the alternative loss is great.
    A. True.
    B. False.

12. What factors affect the home range of deer?

Match the following deer management methods to the appropriate examples.

A. Contact repellent
B. Area repellent
C. Hunting
D. Exclusion

_____ 13. Using fencing to keep deer from harming fruit crops.

_____ 14. Substances the deer eat or taste that deter them from returning. Examples include hot pepper sauce and putrescent egg solids.

_____ 15. Substances that keep deer away by odor. Examples include bars of soap and human hair.

_____ 16. Killing deer during the legal deer hunting season or during other times with a special permit.

17. Special permits for shooting problem deer during the non-hunting season are never issued.
    A. True.
    B. False.