

### **David W. Lockwood**

*Department of Plant Sciences & Landscape Systems  
University of Tennessee  
Knoxville, TN 37996*

### **Jeffrey J. Jackson**

*Department of Forest Resources  
University of Georgia  
Athens, GA 30602*

#### **DEER**

Deer, *Odocoileus virginianus*, are usually the most serious wildlife pests of orchards. They browse small trees, thereby retarding growth. Bucks rub their antlers on orchard trees, often causing severe damage to small replants in established orchards. Rubbing is associated with the breeding season. While antler rubbing occurs from August to March in the Southeast, it is most severe during October and November when the breeding season peaks and bucks actively mark and maintain their territories. Controlling deer damage is often neither easy nor cheap. The most practical methods for reducing deer damage in orchards employ habitat modifications, fences, repellents, and shooting.

**Habitat Modification.** If possible, reduce deer cover by clearing brush and thickets adjoining orchards; get a forester's advice on burning pine timberland. Controlled burns in pine woods will kill bushes and smaller trees to create an open woods that is easy to see into, making it harder for deer to hide near an orchard. The succession of understory plants that predominate after a controlled burn of pine woods encourages growth of more and better browse for deer. If preferred native foods are readily available, deer have less occasion to leave the woods and browse in the orchard. Browsing by deer is rare in autumn if acorns are abundant. Typically, when browse is

scarce during winter and early spring, deer will enter orchards.

Fertilizer and moisture increase palatability of plants. During a summer drought when native food plants become less palatable, deer often seek out irrigated and fertilized nursery and orchard plantings.

**Fences.** Electric fences are usually the most effective solution to a serious deer problem. Weeds must be controlled along the fence line to prevent electrical shorts. A single wire will sometimes repel deer if the population is low or if natural foods are abundant. The effectiveness of a single wire fence can be greatly enhanced by treating the entire length of the wire with a 50/50 mixture of peanut butter and vegetable oil. Likewise, peanut butter will increase the effectiveness of multiple wire fences if only a single wire is treated. Deer smell the peanut butter and "taste" the fence.

Highly visible electric fences such as "glo guard" or other brands with very conspicuous wire are the most effective when used as a single wire. Deer see such fences and investigate with their noses. Thin wires that do not show up well are often broken by running deer that do not see them.

A six-strand electric fence, six feet high, with the bottom wire nine inches above the ground does



very well repelling deer. One of the hot wires should be on a two-foot outrigger 30 inches from the ground. Alternate hot wires and ground wires. Stretch the wires tight to provide firm contact with the animals.

The Pennsylvania five-wire fence is considered the best tradeoff between cost and efficiency. Like other electric fences, it will not keep out all deer. It is constructed with five high-tensile wires stretched to 250 pounds tension with a high-voltage/low impedance (New Zealand type) energizer. Wires are charged so as to shock deer from wire to wire. Spacing is very important. Deer prefer to walk through such a fence and so are shocked by touching two wires. The lower wire is 10 inches above the ground. All other wires are spaced at 12 inches. Baiting the middle wire with peanut butter as described above increases effectiveness.

Unelectrified wire mesh fences will not keep deer out unless they are at least eight feet high. If woven wire fencing is already in place, install two strands of hot wires, 18 and 36 inches high, located 15 to 20 feet outside the existing fence. These wires should repel deer before they come up to the woven fence and jump.

Fencing is quite expensive for small areas. The larger the area enclosed, the lower the cost per acre. For example, a fence that costs 30 cents per linear foot will protect five acres at a cost of \$560 or \$112 per acre. The same fence will cost \$2,504 to protect 100 acres at a cost of \$25 per acre. (Cost does not include the energizer or electricity.)

**Repellents.** Repellents sometimes offer a temporary solution to deer damage. They do work under certain circumstances, but lose their effectiveness with time and rain. Repellents are either taste repellents or area repellents.

Area repellents have an odor that repels deer. Bone tar oil, dung and urine from lions and other big cats, tankage (putrefied slaughterhouse wastes), and human hair are area repellents.

Apply liquid area repellents as follows: Attach a wire hook to one-foot by four-inch strips of roofing felt. Soak strips overnight in a pail of repellent. Place the repellent-soaked strips on trees or stakes

in problem areas. It is important to place area repellent stations at close intervals along the perimeter of an orchard, especially at points where deer enter. Try 10-yard intervals if possible. Some trial and error is required to find the right location and frequency of repellent installations. Human hair in perforated plastic or mesh bags may be effective for a few weeks to prevent deer from rubbing on replants in established orchards. Put a large handful of hair in a bag and tie it to a tree about waist high.

Deodorant soap may be an effective repellent when deer pressure is light to moderate. Suspending a bar of deodorant soap from the main fork in each tree has been effective in reducing deer damage in some trials. Put a small bar of soap in a nylon mesh bag, leaving soap in the wrapper to increase its durability in the orchard. Suspend the soap high enough in the tree that rabbits cannot reach it.

When using repellents, do not wait for damage to start. If you know from experience that deer will be a problem, put out the repellent before the animals arrive. Once deer discover the free lunch, it is difficult to change their habits.

**Shooting.** Reduce deer numbers by persistent hunting during the legal season. Some orchardists lease hunting rights on adjoining woodlands to increase control over deer populations. If severe damage can be documented, state game departments may grant permits to kill deer as needed. Under permit, shooting is most effective after dark, using lights and rifles equipped with telescopic sights.

## RABBITS

The cottontail rabbit, *Sylvilagus floridanus*, is the southeastern rabbit species most likely to occur in uplands and around orchards. Rabbits chew bark and nip twigs, usually within 18 inches of the ground. In colder climates, snow will allow rabbits to reach higher. Rabbit sign can be distinguished from deer sign by chewings and droppings. Rabbit cuttings are sharp edged, unlike deer browsings, which leave a torn end. Rabbit droppings tend to be round, while deer droppings



are oval. In summer, deer droppings are often compacted in a clump.

The most serious rabbit damage usually occurs in nurseries. Heeled-in transplants are especially vulnerable. A three-foot fence of small mesh chicken wire will keep rabbits out. Bury the fence a few inches in the ground. Although rabbits can jump over or dig under such fences, they rarely do so. Prevent grass and weeds from growing along the fence.

Taste or area repellents sometime provide temporary protection from rabbits. Use them in much the same way as deer repellents. Painting taste repellents on stems will reduce chewing on bark. Human hair in mesh bags hung on trees may keep rabbits away from a small area.

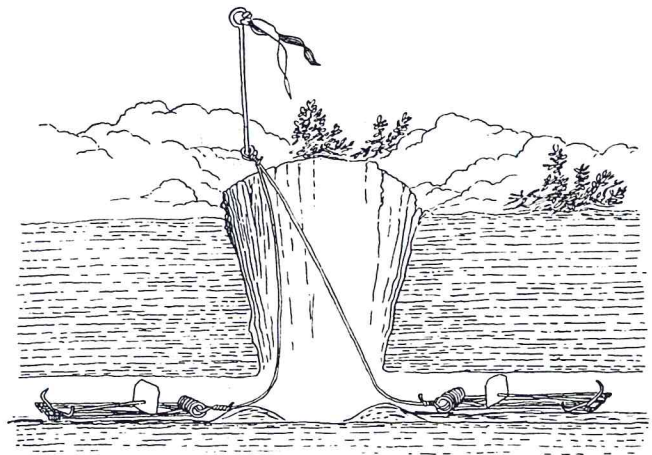
Wooden box traps can be very effective in controlling rabbits. If possible, bait the box with fresh rabbit droppings. Unbaited box traps, as well as those baited with apple peelings, will also catch rabbits.

Remove thickets, brushy areas, and other rabbit habitat near orchards. Hunting during open season may also help. Remember that rabbits can reproduce quickly to replace those that are harvested. Do not trap foxes and other small predators that may help keep rabbit and small rodent populations down.

## POCKET GOPHERS

Pocket gophers are chunky rodents that burrow in soil. They are usually eight to 12 inches long, including the tail, which is about 1/3 the total length. In the Southeast, *Geomys pinetus* is the most widely distributed species. Some other *Geomys* species have very restricted ranges and may be classified as rare, endangered, or interesting species.

Pocket gophers in the Southeast prefer sandy or loose soils in the coastal plain. They dig long burrows (150 yards or more) as deep as 30 inches in their search for food. They excavate numerous side passages to the surface. Side passages are used to push out soil removed from the main burrow. The sandy mounds of soil piled where side passages reach the surface are the origin of the old local



**FIGURE 9.1. Gopher traps in set position. After excavating down to the main runway, traps are set, one in each direction. Partially close the hole behind the traps. Stakes help locate the sets and anchor the traps so they will not be lost. (Figure courtesy of Florida Extension Service.)**

name “Sandy Mounder,” which gradually became changed to “Salamander.” A single pocket gopher burrow may have up to 70 mounds. Usually only one gopher lives in a burrow system.

In orchards, gopher feeding on bark from the base of trees or roots is the key injury. Gophers also cut roots of all sizes and may completely sever the tap root on small trees. In addition, the mounds interfere with mowing.

Traps (Figure 9.1) are very effective for local infestations of a few acres or less. Gopher traps seize the animal when it tries to push past the trap set in the burrow. Set gopher traps by first choosing a fresh mound and digging down along the passage to intersect the main burrow. Cut the burrow in two. Set a trap in each of the two cut ends. Enlarge the burrow if necessary and slide the traps as far back into the burrow as possible. Loosen the soil 1/2 inch deep on the floor of the burrow and press each trap into it. Partially close the burrows with earth. Leave 1/2 inch space at the top. If the burrow is tightly closed, the gopher may not return to close the opening. If the burrow is wide open, the gopher may plug the opening short of the trap. Both traps should be connected to a stake with a wire or light chain.



Gophers are usually caught in traps within an hour after the trap is set. After catching the gopher, stamp down all the mounds in the vicinity and reset the traps. If no fresh mounds appear and no more gophers are caught within two days, move to a new area with fresh mounds.

Poison baits labeled for gopher control may be placed by hand in burrows in the same manner as are traps. In soft earth, try locating burrows with a stick used as a probe. Drop the baits down the probe hole into the burrows.

### SMALL RODENTS

Pine voles, *Microtus pinetorum*, are the most damaging small rodents in most southeastern orchards. Other species of native mice and rats that damage trees by chewing bark are cotton rats, *Sigmodon hispidus*; mice of the genus *Peromyscus*; and meadow voles, *Microtus pennsylvanicus*. Small rodents have cyclic populations. They may alternate periods of scarcity with extreme abundance. Do not shoot or trap hawks, owls, foxes, or other predators near orchards, as these animals reduce the number of rodents.

Pine voles and other rodents may debark stems a few inches above the ground. Unlike the others, pine mice are likely to remove bark from the roots below the ground. Damage by pine mice is

most likely during drought periods when they chew on roots to get moisture.

Keep vegetation in middles closely mowed to discourage rodents. Maintaining a clean herbicide strip will also diminish orchard rodent problems. Baiting with appropriately labeled rodenticides will reduce high populations. Young trees can be protected with a layer of crushed stone three inches deep around the trunk. A cylinder of 3/8 inch (or less) wire mesh will protect trunks. Press these mesh cages into the ground to provide protection below ground.

### BEAVER

Beavers, *Castor canadensis*, can be pests when orchards are located close to ponds and streams. Beavers may flood low-lying orchards or they may cut trees for food or building materials. The best controls are traps, either Number 4 leghold traps or 330 Connibear body grip traps. Set traps in places where fresh beaver signs are present. Repellents are typically ineffective for beaver control. Shooting is usually inefficient and time consuming. See your county agent or state biologist for details on how to trap beaver efficiently.

