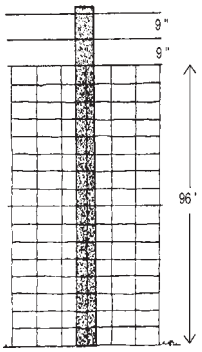
DEER

(Adapted from *Wildlife Management in Fruit Orchards*, Cornell Cooperative Extension Bulletin 236, by P.D. Curtis, M.J. Fargione, and M.E. Richmond.)

White tailed deer cause serious economic losses in orchards. Beyond immediate yield reduction, deer feeding can interfere with scaffold and leader training, delay growth and yield on young trees, or even kill small trees. Damage potential has increased with the shift to smaller trees that have a higher percentage of fruit buds within reach of deer. Newly planted orchards should be protected by deer fence.

Deer browsing leaves ragged broken ends on branches. A systematic survey of 10% of the trees in an orchard provides a quick but accurate assessment of deer damage. If browsing pressure is severe, a long-term plan is needed. The plan should consider exclusion alternatives, habitat modifications, and reduction in animal numbers. Reducing the number of deer in the orchard vicinity can help limit damage and contributes to the efficacy of other measures. However, where there is potential for significant economic damage, herd reduction alone will likely not be adequate. Exclusion methods and habitat modification require more initial effort and expense, but provide more complete and longer-term damage prevention.

Fencing is the most common exclusion technique. High-tensile woven-wire fencing provides the ultimate in protection and durability. Deer can be successfully excluded from large areas with an 8-foot high woven-wire fence with one or more high tensile smooth wires added above to increase fence height to 10 feet. Another advantage of this design is its relatively low maintenance requirement after construction. Disadvantages include the high initial cost, and the difficulty in repairing damaged sections.



A variety of multi-strand, high-tensile, vertical or sloped electric fence designs may effectively exclude wildlife. Electric high-tensile fences can be complete physical barriers, or more often, act as a behavioral deterrent. Deer can be excluded with a 5–6 foot electric fence, even though they can easily jump over woven-wire fences of this height. If properly installed, high-tensile electric fences are easily repaired, and initial cost may only half as much as for 8–10 foot woven-wire designs. Disadvantages include the need for frequent monitoring of fence voltage and for vegetation control to maintain shocking power. Another disadvantage of electric fencing is susceptibility to lightening strikes. Adequate lightning protection is an important component.

The most common reasons why electric fences fail to exclude deer are:

- selection of an unsuitable fence design,
- failure to install fencing according to specifications,
- inadequate maintenance, and
- poor shocking power because of poor grounding.

The use of a bi-polar fence charger, and setting an electrified bottom wire no higher than 10 inches above the soil, are two measures which help insure that probing deer are shocked. Under certain conditions, deer will violate these fences, requiring elimination or re-education of the problem deer.

"Invisible" dog fence is another tool for preventing deer damage. These systems use signals from a buried perimeter wire and specialized collar receivers to contain guard dogs within a crop area. With the proper facilities and maintenance, dogs that have the necessary physical attributes can stay in the orchard year round to repel deer. Initial experience with this approach has had promising results.

The installation expense for a radio collar system is considerably less than the cost to install woven-wire or electric wire fence. However, the ongoing maintenance costs for the dogs (food, veterinarian bills, etc.) need to be considered when comparing with other deer exclusion options. During periods of heavy snow it may be necessary to break trails so that the dogs can get around to patrol the orchard. Selecting suitable dogs is important to the success of this approach. Fencing dealers can provide information on appropriate breeds and training.

Many growers experiment with noncommercial deer repellents. These materials currently have no EPA registration, and their effectiveness has been

inconsistent. Growers relying on repellants should be prepared to tolerate some damage even where deer pressure is low. For best effect, repellants should be applied before deer establish a feeding pattern.

To use small deodorant soap bars, drill a 1/4 inch hole through the center of the bar. Leave the wrapper attached because it reduces weathering; if left in place bars may last several years. Attach the bars with string or wire to outer branches about 30 inches above the ground. There should be no more than 3 feet between bars within the tree. Caution is advised as bar soap sometimes increases vole damage when soap residues run down or drip onto the trunk. Some birds, such as crows, occasionally cause damage to new growth while feeding on soap bars. Human hair can be applied in 1/8 inch (or less) mesh bags and hung in mid-fall and early spring in the same distribution pattern as described for soap bars. Additional applications may be necessary in wet seasons. Light cloth bags filled with 1/2 to 1 cup animal waste can be used in the same way.

Several commercial repellents are available to reduce deer browsing in orchards. With repellents, some damage must be tolerated even if the browsing pressure is low. Big Game Repellant or Deer Away is applied to dormant growth. It works as both a taste and odor repellant. Hinder can be used year round, and is an odor repellant. None of the existing repellents provide reliable protection when deer density is high. Commercial repellants containing predator urine or feces have not been shown more effective than other formulations.

Repellents may be cost-effective when expected degree of damage is not far above a tolerable level, small acreage is threatened, and if only 2 to 3 annual applications will be needed for adequate control. If your situation differs from one or more of these conditions, then exclusion in combination with herd reduction is the most economical long term choice. Sound generating "scare" devices provide protection for only a few days to weeks at best.

RABBITS

Cottontail rabbits can be found throughout southern New England and often cause serious damage to young fruit trees. Damage includes extensive bark removal and severe clipping of lateral shoots. Rabbit feeding leaves larger and more regular gnaw marks than vole feeding.

Habitat control is an effective rabbit population control measure. Overgrown ditches, brushy fence rows, or stone walls provide rabbits with food plants and protection from predators. Elimination of these areas may be all that is needed for adequate rabbit control.

Rabbit damage can be prevented by exclusion with 1/2-inch hardware cloth tree guards that extend 2 feet above the average snow depth. Taste repellents are another effective way to reduce rabbit damage (see following section on Trunk Painting).

TRUNK PAINTING for BARK PROTECTION

A whitewash made from diluted white latex paint applied annually to tree trunks helps protect against killing of cambium or bark from sudden temperature changes in late fall and winter (i.e. "southwest injury"). Whitewashing the lower trunk also makes it easier to detect, and may deter, insect borer infestation. Rabbit repellent can be added to protect young trees from bark stripping during the winter. Whitewash but is not as effective as properly installed tree guards.

To make trunk whitewash, mix one gallon of white interior latex paint into 4 to 5 quarts of water. Do not use oil-based paint. Athletic field marking paint has also performed well as a trunk paint.

Be sure to thoroughly mix all ingrediants, and pour the final mix through a nylon stocking to filter out lumps that would clog the sprayer nozzle. Hand-pump backpack sprayers work well for application.

If the trunk application is to help prevent damage by voles, borers, or rabbits, then the full circumference must be painted. If the application is only for protection against southwest injury, spray only the south half of the trunk and lower scaffolds. It is only the lower parts of the tree exposed to warming by sunlight that need protection of the reflective paint. For best weather resistance, latex paint should be applied during mild (50^{o}F or higher) dry weather.