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PROTECTING ORCHARD TREES FROM DEER

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INTRODUCTION

To determine methods of protecting orchard trees from deer, the writer conducted experiments for three seasons testing different repellents on a number of New England farms. The results were not uniform, some repellents being 100 percent effective, others of little value. Because the cost of treatment is relatively small and there is a chance of success, interested orchardists are invited to give these control measures further trial. Additional study will be necessary to determine the cause of variability of results.

HABITS OF DEER

Early dawn and dusk are the chief feeding periods for deer, although occasionally the animals may be active throughout the night. The time of year when they injure trees varies from place to place. Deer usually begin to feed on new growths as soon as the tender sprouts appear, and they continue to do so through June and July. In some localities the animals injure orchards during the summer months only, while in others their destructiveness continues throughout the year.

Deer sometimes show a decided preference for cultivated plants, and when these are present the animals will turn from laurel, berries, and buds and twigs of the woods to young fruit trees, alfalfa, clover, and garden crops. Among fruit trees, apples are preferred to peaches, and cherries are least attractive. The animals discriminate, also, between the different varieties of apple trees. In one orchard the McIntosh was relished more than the Delicious, and in another the Alexander was apparently liked better than the Northern Spy.

Deer injure fruit trees in three ways: (1) They eat the ends of the lateral branches, particularly the new growths of trees up to 5 or 6 years old; (2) they browse upon the fruit and leaf spurs from the lower branches of older trees (pl. 1, C); (3) they damage the trunk and branches of both young and old trees by rubbing the antlers against the bark.

Considerable damage can be done by a few deer. One orchardist reported 87 2-year-old trees destroyed in 3 nights by 1 deer, as shown by the easily followed tracks, and later, the destruction of 175 trees in 1 night by 6 deer. Another fruit grower had to abandon his entire stock of 1,000 trees that were totally damaged (pl. 1, D) by the animals.

REPELLENT DEVICES AND SUBSTANCES

Scaring Devices

Scaring devices, such as white or colored rags hung on branches, have not proved satisfactory as a method of control. In one locality, white rags were tied to 300 apple and peach trees, and 3 years later deer had damaged the trees so badly that the orchard was pulled up.

Sprays

Several sprays have been used to repel deer, but the animals have been observed browsing on fruit trees almost immediately after an application of lime-sulphur or nicotine dust. Double-strength kerosene emulsion as applied for aphids has been reported to keep deer away from young trees for a week. According to one grower, a combination of paris green and lime was effective, but for a short time.

Standard "Deer-proof" Fences

Many fruit growers have built fences to keep deer outside the orchards. From observations of various heights and types of fences, it is recommended that they should be at least 8 feet high with the strands of wire not more than 7 inches apart. Deer, when pressed, may jump 10- or 11-foot fences. Although a fence that will keep these animals from orchards can be built, the cost is prohibitive to most farmers.

Asafetida

The most successful deer repellent tested by the writer is asafetida. This material is an imported drug supplied in three forms: gum in

mass, gum in tears, and powder. The lump, or mass, form is used in deer control. Lumps the size of a golf ball are placed in a cotton sack, similar to a tobacco bag, and one is hung 3 to 4 feet from the ground on each tree (pl. 1, A). Purchased in small quantities, 1 pound of asafetida costs 35 cents and is sufficient for 12 portions. The bags cost about 1 cent each, or they may be made from cheesecloth for much less.

The repellent odor given off by the asafetida will often keep deer from trees. The odor continues as long as the gum remains soft, but it diminishes with hardening and finally loses its effectiveness. One application, therefore, may last throughout a moist summer, but in dry weather the asafetida may harden in 5 to 6 weeks and the bags will need renewal.

Naphthalene Flakes

A partially effective repellent is naphthalene flakes, a chemical similar in composition to moth balls. These flakes sell for about 5 cents a pound in barrel lots. About 2 heaping tablespoons are used to the bag, 1 pound being sufficient for about 15 portions. For a small tree only one bag is needed, but for trees 5 or 6 years of age about three bags should be used. This material also is affected by weather conditions. In dry periods the fillings last about 2 months, but in wet weather only about 5 weeks. During an average season the bags may be refilled about four times.

Automatic Flash Gun

The automatic flash gun also has proved effective as a scaring device in keeping deer from a number of orchards. This apparatus produces a loud explosion every few minutes, while the pilot burner throws a beam of light in different directions as the device swings about in the wind. The gun is hung from a tree or tripod (pl. 1, B) 4 to 5 feet from the ground and operates by water dripping on carbide, thus generating an explosive gas. Daily renewal of carbide and water is necessary. One gun, which will effectively protect an area of 1,000 trees, sells for \$35, but the operating expense is small. Carbide costs \$6 a hundred pounds, a quantity that should be sufficient for about 3 months, or the average season when damage may occur.

The device is generally set in operation a little before dusk and runs until after daybreak, or until it can be conveniently turned off. Although deer may pass through the orchard while the gun is in use, they usually will not stop to eat.

One disadvantage of the automatic flash gun is that it may be annoying in areas near homes or much-traveled highways. The reports can be heard within a radius of 1 mile if the wind is blowing and within 500 yards if it is not. The report is loud enough to disturb those living in nearby homes, and when the writer conducted experiments in an area through which a State highway passed, a number of people stopped to investigate the supposed shooting.

Tar-paper Cones

Another deer repellent, suggested by County Agent F. H. Lovejoy, of Sanford, Maine, is the use of tar paper, which is cut into 4- by 6-inch pieces, rolled into cones, and held in position with paper clips. The cones are capped or hung on some of the side branches about 3 feet from the ground. For a small tree one cone is probably sufficient. The scent from the tar paper will last 3 to 4 months, when a coal-tar repellent should be painted on the cones, or the paper renewed. According to Mr. Lovejoy, this method gave 100 percent control, and although the deer walked through the orchard they did not browse there.

Traps

Where legal, it is practicable to trap and transplant deer as a method of controlling their damage, but this method is both laborious and expensive. The animals may be trapped in the crate in which they are to be shipped. The crates are fitted with a drop door at each end, a trigger and a treadle board, such as are commonly used in making box traps for smaller animals. Camouflaged with brush and baited with apples, oats, salt, and twigs, the traps are set where deer are known to be feeding extensively. The animals enter the traps freely and can be readily transported for restocking. Further development of this plan may provide a means of removing deer from cultivated sections to others in which they can do no harm.

Electric Fences

Experiments are being conducted to test the value of electric fencing in deer control. This device is discussed by Richard Gerstell ^{1/}, of the Pennsylvania Game Commission, in a recent article in which he explains that the electric fence is convenient when temporary or movable fencing is required. In brief, Gerstell thus describes the fence:

From a given supply source, an electric current of low voltage is fed both into wires insulated from the ground and into the earth. Any living animal simultaneously coming in contact with the charged wires and the ground both "shorts" and "grounds" the established circuit. The passage of current through the living body during the disruption of the circuit results in an electric shock. . . . Apparently to avoid shocking, certain animals will steadfastly refrain from coming in contact with wires which they have come through experience to associate with the sensation of being shocked. Thus, the charged wires are erected along lines beyond which it is desired not to have the animals pass.

Gerstell reported the fences more than 90 percent efficient in preventing deer from entering enclosed plots.

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Gerstell, Richard. Electric Fencing as a Deer Control Agency. Pennsylvania Game News 8 (12): 8, 9, 32, 1938.

While experimental results thus indicate that the electric fence is a successful deer repellent, certain dangers are not yet entirely overcome. Home-made devices, which are not always properly constructed, are to be avoided, for they may take a toll of life, both human and animal. Even approved units are not yet "fool-proof."

At least until more detailed information is available, and until the electric-fencing principle is developed so that few of the present dangers remain, and its effectiveness is greater than that of safer repellents, the Biological Survey recommends its use as a deer control agency only in further experimental work under the direct control of competent persons.

CONCLUSION

Experiments have not been conducted long enough to determine the most effective method of protecting orchards from damage by deer. Tar-paper cones and asafetida seem to be the most successful repellents, and in a number of orchards naphthalene flakes and the automatic flash gun have been effective. Deer trapping, when legal, gives good results but is laborious and expensive. With the exception of the trapping and fencing methods, the successful techniques discussed in this paper are inexpensive, averaging each season about 4 cents a tree. Asafetida is most convenient to the orchardist because it must be renewed but once or twice a season. Tar-paper cones and naphthalene flakes need attention about four times a year. The automatic gun is less convenient because it requires daily attention.

Further experimentation is necessary to determine the deer-repelling method that will be least expensive, require a minimum of attention, and prove most effective. To this extent the Bureau is continuing deer-control investigations along these lines.

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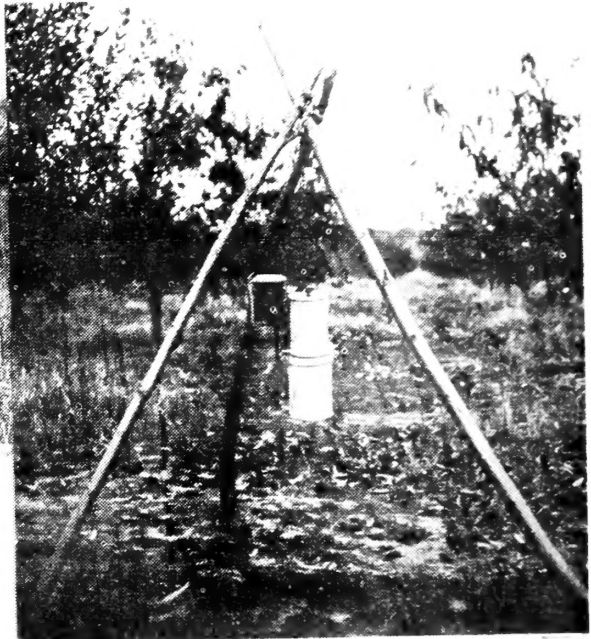
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A. Chemical deer repellents, like asafetida, are placed in bags similar to that here shown on an apple tree in a Granville, Mass., orchard.



B. This automatic flash gun proved effective in scaring deer in a West field, Mass., orchard.



D. Young apple tree almost completely defoliated by deer that browsed in Mount Alto State Forest, Pa.

C. Old apple tree injured by deer browsing on the lower limbs, in Mount Alto State Forest, Pa.

