

University of Nebraska - Lincoln

DigitalCommons@University of Nebraska - Lincoln

Great Plains Wildlife Damage Control Workshop Proceedings Wildlife Damage Management, Internet Center for

December 1975

Control of White-tailed Deer in Field and Orchard

Forrest D. Loomis

Staff Biologist, Forest Game Project, Illinois Department of Conservation, Springfield, Illinois

Ronald Ogden

Populations Management, U.S. Department of the Interior, Springfield, Illinois

Follow this and additional works at: <https://digitalcommons.unl.edu/gpwcwp>



Part of the [Environmental Health and Protection Commons](#)

Loomis, Forrest D. and Ogden, Ronald , "Control of White-tailed Deer in Field and Orchard" (1975). *Great Plains Wildlife Damage Control Workshop Proceedings*. 197.

<https://digitalcommons.unl.edu/gpwcwp/197>

This Article is brought to you for free and open access by the Wildlife Damage Management, Internet Center for at DigitalCommons@University of Nebraska - Lincoln. It has been accepted for inclusion in Great Plains Wildlife Damage Control Workshop Proceedings by an authorized administrator of DigitalCommons@University of Nebraska - Lincoln.

Presented at the Second Wildlife Damage Control Workshop, Kansas State University, Manhattan, Kansas, December 8-11, 1975.

CONTROL OF WHITE-TAILED DEER IN FIELD AND ORCHARD

Forrest D. Loomis, Staff Biologist, Forest Game Project, Illinois Department of Conservation, Springfield, IL. 62706

Presented by: Ronald Ogden, Populations Management, U. S. Department of the Interior, Springfield, IL. 62701

Abstract: As deer populations increase in most areas of the mid-west, and deer habitat is constantly shrinking because of man's activities, damage done to crops, orchards, and other plantings is increasing. No new or revolutionary control or repellent has been perfected to alleviate this complex problem. Annual hunting still offers the best and cheapest method of control.

As a result of the pioneers moving westward and opening clearings in virgin forests in the early nineteenth century, deer habitat was temporarily improved throughout the mid-continent. Rapid human population increases, resulting in a greater demand for venison, plus year-round hunting, exterminated the deer from Ohio, Indiana, Illinois, Iowa and southern Michigan by the early 90's. Token populations remained in southern Wisconsin and Minnesota, and in the Missouri Ozarks.

Restocking programs, from the 1930's to the 1950's, occurred throughout most of this area. This, coupled with the natural emigration of deer from areas not completely depleted, resulted in a huntable population in the 1950's.

Cropland interspersed with mature woodlands supplied year-round food, and scrub areas combined with weedy patches and brushy hedgerows supplied cover for deer.

During W. W. II, and thereafter, idle land on farms fast disappeared. Despite government land retirement programs, brushy and timbered areas disappeared, and croplands and pastures increased.

Understandably, the farmer is caught in the middle. Operational costs have skyrocketed; equipment and land and fertilizer costs have increased so greatly that every acre is farmed to its limit. Previously untillable areas are being bulldozed, drained, or tilled and converted into productive farm-ground.

The inefficiency of operating small farms is being phased out in form of more effective large units. Fence rows, and consequently much desired wildlife cover, are being removed in favor of one or two crop farms. Most farms are strictly grain, instead of a mixture of livestock and grain farming.

CROPS MOST DAMAGED AND ECONOMIC ASPECTS

White-tailed deer (Odocoileus virginianus) forage on a wide variety of crops, but usually prefer the "expensive" ones. They seem to especially enjoy the tender shoots of developing plants. It has also been reported (Pasto, 1954) that deer prefer fertilized crops over unfertilized ones, in search of something that gives them a better balanced diet.

One method to alleviate damage is to plant buffer strips of food deer prefer, or change permanently the type of crop to one not heavily utilized by deer.

What protection is there against these depredators? Landowners and tenants may obtain permission to shoot deer in some states. Financial reimbursement is practiced by others, however this is costly and takes manpower to investigate and process claims. Also, damage claim payments do nothing to solve the problem, and is generally agreed by the states that have such a program, that this approach constitutes financial strangulation. (Roberts, 1964)

Missouri, acorns were the most desired food item comprising almost 55% of volume of deer rumen contents. For a 5-year period in Missouri, acorns and oak leaves mad up 42.5% of the total of principal foods, and corn 14.3%. This study indicated that increased use of agricultural crops, rather than native vegetation, was evident during years of poor mast production (Korschgen, 1954). Oats, corn, and apples are the crops that received the greatest damage payments in Wisconsin (Dahlberg and Guettinger, 1956). A food habits study of Iowa deer revealed that, corn and soybeans were the two most important food items utilized by deer (Mustard and Wright, 1964).

Despite the abundance and accessibility of natural forage, deer seem to always do a certain amount of browsing on agricultural crops (Dahlberg and Guettinger, 1956).

ORCHARD DAMAGE

Damage to fruit-bearing trees can occur in a variety of ways. Browsing is the most frequent complaint heard from orchardists. Nipping of new growth, terminal growth, and lateral twigs in winter, and developing buds in spring-time is most common. Much work pruning and shaping fruit trees is cancelled out by deer browsing, with a resultant loss of crop.

Fruit is also eaten by deer both on the trees and after it has dropped on the ground. It has been reported (Biehn, 1951) that apple, prune, cherry, peach, pear, and apricot fruits were readily eaten when within reach of deer or when they had fallen.

Antler rubbing, while not as widespread as browsing, is usually quite severe in extent of damage. The stripping of bark through rubbing can girdle and kill a tree, or cause deformity in growth. Other young trees used by bucks may be twisted and or broken and consequently require replacing.

Buck rubbing, in many cases, has injured the bark of developing fruit trees so severely that the limbs are weakened and must be trimmed or cut off entirely.

Browsing and rubbing on newly-established saplings is especially critical. Lutz and Chapman (1944) indicated the average diameter of forest trees and stems rubbed to be 1.5 inches, varying from 0.5 to 4.7 inches. This has been evidenced to be true in orchards, also. Deer browse on saplings about an inch or less in diameter. Buck rubbing is confined primarily to that section of a tree trunk between $1\frac{1}{2}$ and $3\frac{1}{2}$ feet above the ground (Pearce, 1947).

CULTIVATED CROP DAMAGE

The most extensive damage done to cultivated crops occurs in the late spring when young plants are just developing. As soon as young corn and soybean plants are three to six inches high, they are preferred by deer. This can result in hundreds of dollars damage each night. When soybean plants are larger and branched out, many recover from light to moderate browsing, but when nipped off beneath the dicotyledonous leaves, they must be replanted.

Wheat, clover, rye, buckwheat, alfalfa, and oat fields are damaged in two ways; most frequently by deer grazing, but also by the action of their hooves pawing, tearing up the field, and trampling crops.

Long fields planted with a crop and surrounded by woodlands are more likely to be heavily damaged than if the same crop were planted in fields located in open farmland. Areas just one farm removed from deer habitat more often will escape damage. In general, deer do not like to get too far from cover. The number of damaged fields drops off rapidly as distance from woodlands is increased (Pasto, 1954).

It also appears that deer will shift their center of activity to a concentrated food source available within their home range. The deer will apparently not shift their home ranges any great extent solely to reach a concentrated food supply (Byford, 1969).

ORNAMENTAL STOCK DAMAGE

While not as widespread in actual damage incidents as cultivated crops or orchards, nursery stock and private ornamental plantings have been reported

damaged by browsing deer. Christmas tree growers complain of deer browsing on small developing conifers, and buck rubbing certainly alters conformation of sheared Christmas trees.

CONTROL OF DAMAGE

Scare Devices

Noise devices such as shell crackers and propane exploders have generally proven to be of little value in controlling deer damage. The effect of such devices at the onset is positive, but after a short duration the animals become accustomed to the noise and tend to ignore it.

Flashing lights, kerosene lanterns, flares, and other visual repellents have been tried with only marginal success of short duration.

A sonic device emitting a noise unpleasant to deer was used successfully over a small area, and fireworks triggered at sporadic intervals during the night have enjoyed limited success (Harder, 1968).

Scare devices, generally, are expensive, require constant maintenance, and usually prove ineffective as a repellent in the long run.

Removal of Deer

The trapping and removal of deer is, of course, very expensive, time consuming, and ineffective. Removal by shooting by professional wildlife personnel in areas of especially heavy damage, or areas of local eruptions, is effective. Control by spotlighting is used with much success (both legally and illegally!), and the deer carcasses can be donated to state agencies. In some instances the first-killed deer is given to the landowner or tenant, since he has suffered the loss. This, at times, makes him more tolerant of the remaining deer. It has been observed that if the animals are field dressed and the entrails left in or near the damaged crop areas, this will act as a repellent to other deer.

Fencing

A conventional fence constructed of wire mesh and 8 feet high, topped with barbed wire, is effective in keeping deer out of an area if it is

maintained constantly, with no areas open to deer for access (gullies, drainage areas, etc.). It is also extremely expensive.

Modified fences can be used in large areas with a great degree of success. A relatively inexpensive electric fence can be installed that has proven effective. Some maintenance is involved in keeping the bottom wire free from grounding out against weed growth or snow, however, the bottom wire can be removed if necessary. It can also be easily rotated with the crops.

Individual trees, such as newly planted fruit trees, can be effectively protected by installing two or three 2' x 2' stakes three to four feet long, about the tree. The ends should be wired together at the top. Also effective is the attaching of 64-inch poultry wire around the stakes. Such a fence prevents browsing and antler rubbing on smaller trees. This type of protection for individual trees is also less expensive than fencing an entire orchard.

While fencing is an effective method of controlling damage caused by deer, it is all but prohibitively expensive except in instances of high-value crops (Longhurst et al. 1952).

Chemical Repellents

Various chemical repellents have been tried throughout the years, varying from lion seats to moth balls, all effective to a degree but limited in longevity, availability, and ease of application (Biehn, 1951). Also, periods of greatest activity, and damage, has been shown to be from 5 to 10 A.M. and 5 to 11 P. M.

A popular and readily available repellent is fresh blood meal and bone meal mixture in a one to one ratio, or tankage, either broadcasted around the perimeter of a field, or attached to individual orchard trees in small "Bull Durham" type cloth bags. An insecticide mixed with the meal deters insect damage to the repellent.

Tankage contains hair and other matter which clogs sprayers and some spreaders, but is an effective repellent.

There are two general classes of repellents: (1) winter or dormant season; and (2) summer, or growing season.

Some manufactured repellents on the commercial market are effective deterrents to deer damage. Goodrite ZIP (zinc dimethyl dithiocarbamate cyclohexamine complex) is perhaps the most popular representative. Also popular, and available, are Arasan 75 and Arasan 42-S. Research differs in the effectiveness of these sprays, from ineffective to 100% effective. Other commercial products are being tested, however in most cases the cost is considerable and use is deemed advisable only in cases of heavy deer damage.

Population Control

Without question, the most practical deer herd control is through public hunting. An any-deer season in areas of heavy damage is the most economical method of control, though not as effective immediately as other methods.

Special hunts have been utilized in areas around wildlife refuges, and on the refuges themselves. Open to unsuccessful deer hunters from the past legal season, deer hunts have been conducted in late winter in areas such as prison buffer lands and state and federal refuges. Independent farmers usually **suffer** severe crop damage in lands adjacent to the aforementioned areas.

Annual hunting tends to disperse large concentrations of deer, resulting in less conflict with farming activities.

SUMMARY

Although deer, by nature, are browsing animals which exist on natural vegetation, they will utilize crops and orchards when available. Thus deer populations must be controlled to prevent unacceptable amounts of damage to these plantings. The most practical method of control is public hunting combined with any-deer seasons.

Alternative methods are available to mechanically or chemically control damage, but **these** are temporary in nature and costly. They also do nothing about the problem, but simply alleviate a symptom.



CONTROLLING DEER

Deer are game animals of great economic importance. As a group, they are the most widely hunted and prized of all big game species. Deer have increased in many areas to such an extent that serious damage has resulted to forest and agricultural crops.

Deer cause damage by browsing the terminal and lateral growth of desirable trees, vertically stripping the bark from tree trunks, polishing or rubbing antlers on small trees, and grazing green succulent agricultural crops.

Control

In many cases, damage is the direct result of too many deer competing for a limited supply of natural food. Larger harvests of deer during the hunting season would reduce this damage by lowering the number of animals competing for the same food supply. Doe hunting is often necessary in order to reduce the reproductive capacity of a herd and prevent a rapid increase to former numbers. Where a sufficient reduction in population is not possible or fewer animals still cause serious damage, the use of mechanical or chemical methods will be necessary to reduce damage.

Fencing

An 8-foot, woven-wire fence will keep deer out of an area under most conditions. Woven-wire fencing is available in 4-foot widths and can be used to construct an 8-foot fence. Stay wires should not have more than a 6 inch spacing, top and bottom wires should be at least 9 gauge with wire mesh 11 gauge wire. Barbed wire may be strung above the woven wire if more height is desired.

The electric fence, shown below, is designed primarily for summer use. Weeds and grass must be kept cut or killed with herbicides to prevent them from grounding the lower wire. If the fence is used during the winter and the lower wire becomes buried in snow, shut off the electricity to this wire. Use 1/2 inch wood stock for posts and crossarms and 18 gauge steel-core wire for fencing. Space posts 30-45 feet apart. About 2,500 feet of wire and 20-28 posts with 40-56 crossarms will be required to fence one square acre. NOTE! Deer, like farm animals, must learn about an electric fence, therefore, breaks may be frequent just after installation. Fencing must be inspected regularly and breaks repaired immediately.

Electric Deer Fence

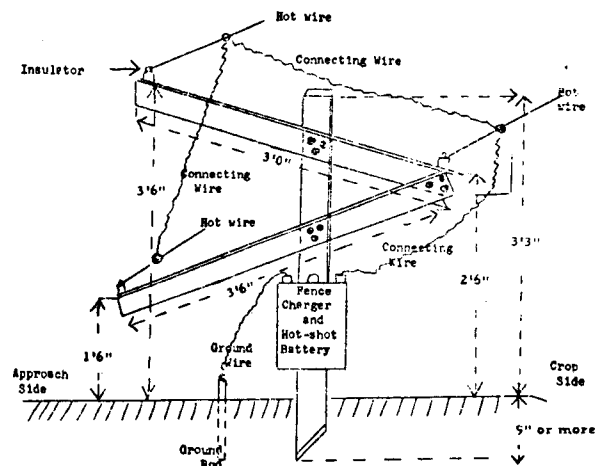


Diagram - by New Hampshire Fish and Game Dept. - Game Damage Section

Repellents

Chemical repellents offer another method for reducing deer damage. Area or odor repellents, such as bone tar oil, dried blood, creosote oil, mountain lion urine, artificial human sweat, etc., are not effective. Taste repellents are effective and have proven to be practical. They are divided into two general classes: winter or dormant season, and summer or growing season repellents.

Winter Repellents

Improved Z. I. P. (a commercial ZAC-Rhoplex product with methocel already added.) Brush or spray application: Add 1 gal. of Improved Z. I. P. to 1 gal. of water. Mix thoroughly.

Arasan 75 - Brush or spray application: Add 1 qt. Rhoplex AC-33 or Latex 512R to 2-1/2 qts. of water. Mix thoroughly with 1 lb. of Arasan 75. Stir frequently. For best results as a spray application, use 0.5 millimeter orifices or larger and 50-mesh strainer. Stir frequently.

Arasan 42-S - Brush or spray application: Add 1 qt. Rhoplex AC-33 or Latex 512R to 2 qts. of water. Mix thoroughly with 1 qt. of Arasan 42-S. Caution: Mix only enough repellent for immediate use as the solids in the finished preparation settle after standing several days and are difficult to re-suspend.

Application of the repellent only to the terminal tips will provide sufficient protection to the trees. This method is more economical than treatment of the entire tree. Treat all terminal tips to a height of six feet above the expected snow line.

The use of trade names implies no Government endorsement of commercial products.

It is difficult to make repellent films adhere to the smooth, waxy surface of the new growth of small-stemmed hardwoods, small conifers, and certain other plants. The addition of a thickening agent, Methocel, 1500 c. p. s. viscosity, technical grade, and a defoaming agent, Hexadecanol-ethanol, 70% material, makes a repellent film more weather resistant. Only a small amount is required to gain a considerable increase in weathering properties. Methocel is added at the rate of 0.2% or about 1/4 ounce per gallon. Hexadecanol-ethanol is added at the rate of 0.6% or about 3/4 ounce per gallon. For home use these can be omitted.

Summer Repellents

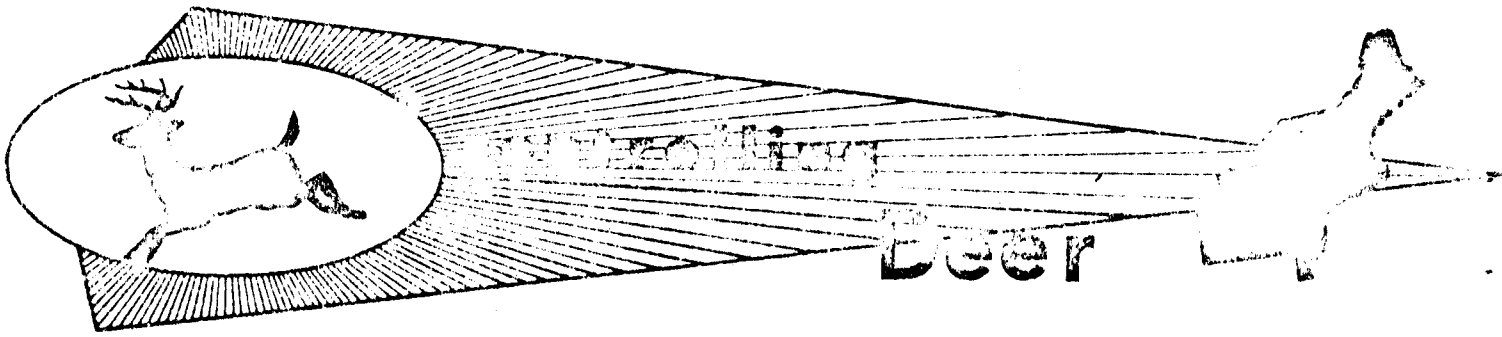
Improved Z. I. P. - Spray application: Add 1 qt. Improved Z. I. P. to 7 qts. of water. Mix thoroughly.

Arasan 75 - Spray application: Add 1 qt. Rhoplex AC-33 or Latex 512R to 1 1/2 qts. of water. Mix thoroughly with 1 lb. Arasan 75. Caution: Strain and stir as outlined in winter spray application.

Arasan 42-S - Spray application: Add 1 pt. Rhoplex AC-33 or Latex 512R to 7 qts. of water. Mix thoroughly with 1 pt. Arasan 42-S. See "caution" statement under winter spray application. It may be necessary to apply repellents frequently in order to cover new growth.

Do not treat vegetables after edible portions have started to form on beans, cabbages, lettuce, etc. as the repellents may be enclosed.

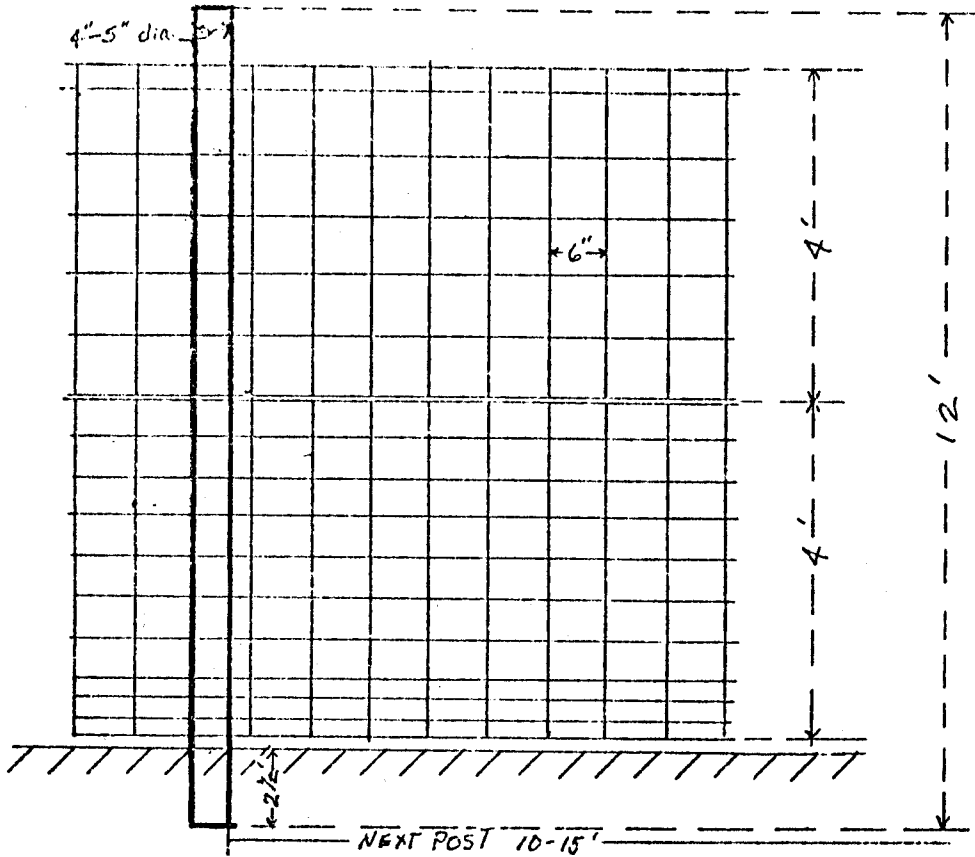
12/68



FISH AND WILDLIFE SERVICE - BUREAU OF SPORT FISHERIES AND WILDLIFE

Woven-wire Fence

Under most conditions, an 8-foot woven-wire fence will keep deer out of an area. The woven-wire fencing is available in 4-foot widths and can be used to construct an 8-foot fence. The stay wire should not have more than a 6-inch spacing. Barbed wire may be strung above the woven wire if more height is desired. The fence should be inspected periodically and breaks repaired. (Approximately 1,700 feet of woven-wire fencing, and 55-60 posts with tops of 4 to 5 inches in diameter, will be required to fence one acre. Posts should be set 10-15 feet apart. Corner posts and points of stress should be braced.)



HUNTING

Depending upon state regulations, problem deer can be removed during the regular deer hunting season. Farmers can show hunters the problem areas which the deer are frequenting. This will enhance the hunter's chances and also remove deer which are causing damage.

Revised APRIL, 1970