DEER PROBLEMS IN RESIDENTIAL AREAS

The White Tailed Deer is the most important game animal in North Carolina. The economic value of deer hunting can be measured in terms of hunter expenditures for equipment, food, transportation, and license fees. Deer populations have been increasing in many areas of the state since the 1950's. Due to increasing human populations and associated development conflicts between deer and people are inevitable. Residential construction in previously undeveloped areas forces deer and other animals into smaller and smaller pockets of suitable wildlife habitat. Landscaping by landowners results in the planting of ornamentals that become expensive browse for deer that have been displaced. Residential areas are often located adjacent to lands that continue to support large numbers of deer. Hunting is generally not an option for controlling deer populations within residential areas and deer become less and less afraid of people, dogs, lights, and automobiles. The challenge is for residents to learn how to live with deer in their neighborhoods and for surrounding landowners to learn how to effectively control their deer populations.

Is it a deer problem or is it really a "people problem"?

Different people have many different perspectives on how wildlife interactions affect their lives and property. Within the same residential neighborhood there will be some people who enjoy seeing deer in their yards (and may actually be feeding them) and other people who are extremely mad that deer are browsing on their expensive plants (and want to get rid of them all). Some people are more pragmatic and simply accept the inevitable (if you live in an area with a high deer population you shouldn't be surprised to have deer eating your plants). The deer are behaving normally - browsing on herbaceous plants is natural for them. It only becomes a problem when people place a higher value on their ornamental plants than on the wildlife that lived in the area before the houses were built.

What attracts deer into a residential area?

Many of the most popular landscaping plants are highly palatable for deer because of their high nutritional value, accessibility, and the tender new growth they provide. Azaleas and flowers are among the plants most susceptible to deer browse damage. Residents who live in areas with high deer populations must accept the reality that if they plant ornamental shrubs and flowers that are attractive to deer there is a strong possibility that they will incur damage. Landscaping plans should be adapted to utilize fences, rocks, and other materials instead of ornamental plants whenever possible. Plants that are used should be selected for their resistance to deer damage. Residents who live in areas with high deer populations must be aware of the risks if they choose to spend a lot of money on ornamental plants that may end up being expensive deer browse.

Most problems are seasonal

Most deer depredation problems in residential areas are seasonal and are worse in the winter months than at other times of the year. Deer depend primarily on hard mast (acorns) in the fall to fatten up for winter. Deer compete for hard mast with

squirrels, turkeys, bears, and other animals. Acorns are often scarce by late winter. Hard mast crops are inconsistent from year to year and occasionally a hard mast failure will leave virtually no acorns available. During years with poor mast crops deer subsist primarily by browsing on herbaceous plants and depredation problems in residential areas may become severe. The problems usually subside to some extent in spring when native vegetation begins to green up.

Why not just move deer from residential areas?

There are several reasons why moving problem deer is not an option. First and foremost, moving deer does not solve the problem. If a residential neighborhood is located near an area with a high deer population other deer will just move into the neighborhood. Trapping deer is very difficult and expensive even under the best of circumstances. It would be virtually impossible to catch enough deer in a residential situation to make any difference. Deer that have been relocated often do not survive long because of the stress involved in the trapping and transportation process and the difficulty in adapting to a new area. There are basically two trapping methods available. Using rocket nets is the most effective, but it requires large open areas (fields) where rockets and explosives would not create a hazard to houses and people. The second method, using tranquilizer darts, is very difficult and is usually ineffective. Tranquilizer guns have a very limited range and a shooter would have to be within a few yards of a deer to take a shot. It would be extremely time consuming and expensive to try to "hunt" deer (even fairly tame ones) because of their nocturnal habits and variable travel routes and schedules. Tranquilizers also take several minutes to work and a deer can run a long ways after being struck by a dart. The chances of finding a deer in a timely manner are not good. Finally, darts and drugs are dangerous! A dart can easily be lost when shot from a dart gun. The possibility of losing a dart full of dangerous drugs in a residential area where it could later be found by children is unthinkable. In short, there is not a safe and effective way to catch and relocate deer from a residential situation.

How are deer problems best handled?

1. Exclusion

There are many types of deer fences and barriers that can be effective in certain situations. Permanent or temporary electric fences work best but most residential property owners prefer not to erect large fences to protect their yards. Smaller woven wire fencing can be used to protect individual plants until they are large enough to be less desirable for deer browse. Deer generally eat only the new growth on the tips of branches. Once they develop hard woody stems the main body of the plant is less susceptible. However the tips and buds remain vulnerable and deer browsing will prevent flowering and new growth.

2. Repellants

There are many types of commercial and home remedy repellants that may work on deer. The key is to use them early, before the deer become accustomed to browsing on your plants. Repellants may serve to keep deer out of your yard (and in the yard of your neighbors) until your neighbors start to use them. Repellants may not work if the deer are hungry enough. Most are short-lived and wash off with rain or wear off in a short period of time.

3. Frightening

Most frightening devices for deer involve loud noises which may not be suitable in a residential environment. Deer quickly

become accustomed to security lights and motion detectors. Dogs can keep deer out of a yard. However many residential areas have homeowners restrictions that prohibit large dogs.

4. Shooting

The discharge of firearms is prohibited by city or county regulations in most residential areas (including bow and arrow in some cases). Ordinances may not specifically prohibit certain types of weapons and there may be some instances where a shotgun or bow and arrow might be allowed where a landowner's yard adjoins a large tract of undeveloped land. Hunting during the legally established hunting season should be the preferred method of reducing a deer population where weapons are legal. A depredation permit to kill deer out of season can be issued (to a specific landowner on his own property) by the North Carolina Wildlife Resources Commission in cases where it is deemed to be safe and practical. However in most residential situations, especially where lots are small and houses are in close proximity to each other, the discharge of any weapon (including bow and arrow) is dangerous and depredation permits will not be issued.

5. Population control

The most effective way to reduce deer depredation problems in residential areas is through population management in the surrounding area. Population management can usually be achieved through the legal harvest of deer during regular hunting seasons. Landowners adjacent to the residential area must be willing to allow enough hunters to participate and enough deer of both sexes to be killed to affect the population. This is a long term solution that depends on cooperation and communication between property owners in a residential area and adjacent landowners where high populations of deer exist.

Summary

Managing deer depredation in residential areas is often more of a people management problem than a deer management problem. There is usually one faction that wants to get rid of the deer and another faction that wants to protect the deer. There is rarely ever a way to satisfy everyone. There are some repellants and exclusion devices that may help residents to reduce damage to their ornamental plants. There are often some steps that can be taken by local landowners (if they are willing to cooperate) that will help to reduce, control, and manage deer populations in the area in the long term. However the bottom line is simple: if you live in an area with a high deer population don't spend a lot of money on expensive ornamental plants. There will probably always be a significant deer population in the area and if you choose to plant species that are attractive to deer you will always have deer depredation problems.

Damage Prevention and Control Methods

Exclusion

Where deer are abundant or crops are particularly valuable, fencing may be the only way to effectively minimize deer damage. Several fencing designs are available to meet specific needs. Temporary electric fences are simple inexpensive fences useful in protecting garden and field crops during. Deer are attracted to these fences by their appearance or smell, and are lured into contacting the fence with their noses. The resulting shock is a very strong stimulus and deer learn to avoid the fenced area. Permanent high-tensile electric fences provide year-round protection from deer and are best suited to high-value specialty or orchard crops. The electric shocking power and unique fence designs present both psychological and physical barriers to deer. Permanent woven-wire fences provide the ultimate deer barrier. They require little maintenance but are very expensive to build. Fencing in general is expensive. You should consider several points before constructing a fence, such as:

History of the area — assemble information on past claims, field histories, deer numbers, and movements to help you decide on an abatement method.

Deer pressure — this reflects both the number of deer and their level of dependence on agricultural crops. If deer pressure in your area is high, you probably need fences.

Crop value — crops with high market values and perennial crops where damage affects future yields and growth often need the protection fencing can provide.

Field size — in general, fencing is practical for areas of 40 acres (16 ha) or less. The cost per acre (ha) for fencing usually decreases, however, as the size of the area protected in-creases.

Cost-benefit analysis — to determine the cost effectiveness of fencing and the type of fence to install, weigh the value of the crop to be protected against the acreage involved, costs of fence construction and maintenance, and the life expectancy of the fence.

Rapidly changing fence technology — if you intend to build a fence your-self, supplement the following directions by consulting an expert, such as a fencing contractor. Detailed fencing manuals are also available from most fencing manufacturers and sales representatives.

Temporary Electric Fencing

Temporary electric fences provide inexpensive protection for many deer depredation situations (see attached designs for the "Peanut Butter" and "Polytape" fences). They are easy to construct, do not require rigid corners, and materials are readily available. Install fences at the first sign of damage to prevent deer from establishing feeding patterns in your crops. Weekly inspection and maintenance are required. Different types of temporary electric fences are described below.

Permanent High-Tensile Electric Fencing

High-tensile fencing can provide year-round protection from deer damage. Many designs are available to meet specific needs. All require strict adherence to construction guidelines concerning rigid corner assemblies and fence configurations. Frequent inspection and maintenance are required. High-tensile fences are expected to last 20 to 30 years. Different types of high-tensile electric fences are described below.

Tree Protectors

Use Vexar®, Tubex®, plastic tree wrap, or woven-wire cylinders to protect young trees from deer and rabbits. Four-foot (1.2-m) woven-wire cylinders can keep deer from rubbing tree trunks with their antlers.

Haystack Protection

Wooden panels have traditionally been used to exclude deer and elk from hay-stacks. Stockyards have also been protected by welded wire panels and woven wire. More recently haystacks have been protected by wrapping them with plastic Tensar® snow fence. The material comes in 8-foot (2.4-m) rolls and is relatively light and easy to use.

Cultural Methods and Habitat Modification

Damage to ornamental plants can be minimized by selecting landscape and garden plants that are less preferred by deer. In many cases, original landscape objectives can be met by planting species that have some resistance to deer damage. Table 1 provides a list of plants, ranked by susceptibility to deer damage. This list, developed by researchers at Cornell University, is applicable for most eastern and northern states.

Harvest crops as early as possible to reduce the period of vulnerability to deer. Plant susceptible crops as far from wooded cover as possible to reduce the potential for severe dam-age. Habitat modification is not recommended. Destruction of wooded or brushy cover in hopes of reducing deer use would destroy valuable habitat for other wildlife. Also, since deer forage over a large area it is unlikely that all available deer cover would be on a farmer's or rancher's land.

Frightening

One of the keys to success with frightening devices and repellants is to take action at the first sign of a problem. It is difficult to break the movements or behavioral patterns of deer once they have been established. Also, use frightening devices and repellants at those times when crops are most susceptible to damage, for example, the silking to tasseling stages for field corn or the blossom stage for soybeans.

Gas exploders set to detonate at regular intervals are the most commonly used frightening devices for deer. They can be purchased for $200 to $500 from several commercial sources (see Supplies and Materials). To maximize the effectiveness of exploders, move them every few days and stagger the firing sequence. Otherwise, the deer quickly become accustomed to the regular pattern. The noise level can be increased by raising exploders off the ground. Motion-activated firing mechanisms are now being explored to increase the effectiveness of exploders. Success depends on many factors and can range from good to poor. A dog on a long run or restricted by an electronic invisible fence system can keep deer out of a limited area, but care and feeding of the dog can be time-consuming. Free-running dogs are not advisable and may be illegal.

Shell crackers, fireworks, and gunfire can provide quick but temporary relief from deer damage. Equip mobile units with pyrotechnics, spotlights, and two-way radios. Patrol farm perimeters and field roads at dusk and throughout the night during times of the year when crops are most susceptible to damage. Such tactics cannot be relied on for an entire growing season.

Repellants

Repellants are best suited for use in orchards, gardens, and on ornamental plants. High cost, limitations on use, and variable effectiveness make most repellants impractical on row crops, pastures, or other large areas. Success with repellants is measured in the reduction, not total elimination, of damage.

Repellants are described by mode of actions as "contact" or "area." Contact repellants, which are applied directly to the plants, repel by taste. They are most effective when applied to trees and shrubs during the dormant period. New growth that appears after treatment is unprotected. Contact repellants may reduce the palatability of forage crops and should not be used on plant parts destined for human consumption. Hinder® is an exception in that it can be applied directly on edible crops.

Area repellants are applied near the plants to be protected and repel deer by odor alone. They are usually less effective than contact repellants but can be used in perimeter applications and some situations where contact repellants cannot.

During the winter or dormant season, apply contact repellants on a dry day when temperatures are above freezing. Treat young trees completely. It will be more economical to treat only the terminal growth of older trees. Be sure to treat to a height of 6 feet (1.8 m) above expected maximum snow depth. During the growing season, apply contact repellants at about half the concentration recommended for winter use.

The effectiveness of repellants will depend on several factors. Rainfall will dissipate some repellants, so reapplication may be necessary after a rain. Some repellants do not weather well even in the absence of rainfall. Deer's hunger and the availability of other more palatable food will have a great effect on success. In times of food stress, deer are likely to ignore either taste or odor repellants. When using a commercial preparation, follow the manufacturer's instructions. Don't overlook new preparations or imaginative ways to use old ones. The following discussion of common repellants is incomplete and provided only as a survey of the wide range of repellant formulations available. The repellants are grouped by active ingredient. Trade names and sample labels for some products are provided in the Supplies and Materials section.

Toxicants

No toxicants are registered for deer control. Poisoning of deer with any product for any reason is illegal and unlikely to be tolerated by the public.

Herd Reduction

A reduction in a local deer population may be appropriate to alleviate deer depredation. Damage may result from a few problem deer or at locations close to a winter deer yard or other exceptional habitat. Local reductions in deer populations can usually be accomplished by allowing hunters to harvest deer during the regular established hunting seasons.

Live Capture

Live capture and relocation of deer is very expensive, time consuming, and usually does not solve deer depredation problems. Other deer quickly move in and replace the deer that have been removed. The survival rate of deer relocated to other areas is poor and generally does not benefit areas with low deer populations. Live capture of deer is rarely justifiable.

Shooting

Effective use of the legal deer season is probably the best way to control deer populations. By permitting hunting, landowners provide public access to a public resource while at the same time reducing deer damage problems. Because of the daily and seasonal movements of deer, only rarely does a single landowner control all the land a deer uses. As a result, neighboring landowners should cooperate. Landowners, the state wildlife agency, and local hunters should reach a consensus about a desirable population level for an area before deer are removed.

Mechanisms for managing deer population levels in a specific area already exist in most states. Either-sex seasons, increased bag limits, antlerless only permits, special depredation seasons, and a variety of other management techniques have been used successfully to reduce deer numbers below levels achieved by traditional "bucks only" regulations.

Shooting permits may be issued for removal of problem deer where they are causing damage during non-hunting season periods. Use of bait, spotlights, and rifles may increase success but techniques must be consistent with the specifications of the permits.

Economics of Damage and Control

A national survey conducted by USDA's National Agricultural Statistics Service in 1992 identified deer damage as the most widespread form of wildlife damage. Forty percent of the farmers reporting had experienced deer damage. The situation is similar in most agricultural states with moderate to high deer densities. Estimates by Hesselton and Hesselton (1982) suggest that the cost of deer-vehicle collisions may exceed $100 mil-lion each year in the United States and Canada.

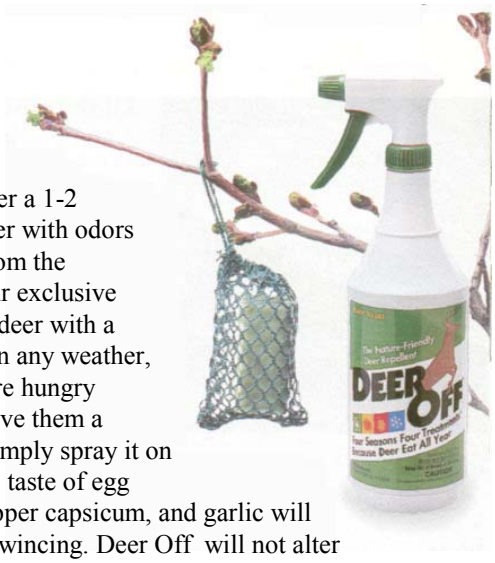
Deer also damage nurseries, landscape plantings, and timber regeneration. However, as established earlier, deer are a valuable public resource. Cost estimates for control techniques were presented with the appropriate techniques. A cost/benefit analysis is always advisable before initiating a control program. Two additional economic aspects are worth consideration. One involves farmer tolerance for deer damage. Two summaries of social science research related to deer damage (Pomerantz et al. 1986, and Siemer and Decker 1991) demonstrated that a majority of farmers were willing to tolerate several hundred dollars in deer damage in exchange for the various benefits of having deer on their land. Thus "total damage" figures are misleading because only a small percentage of the farmers statewide or nationwide are suffering sufficient damage to warrant control.

COMMERCIAL DEER REPELLANTS

Deer-Away® Big Game Repellant (37% putrescent whole egg solids). This contact (odor/taste) repellant has been used extensively in western conifer plantations and reported in field studies to be 85% to 100% effective. It is registered for use on fruit trees prior to flowering, as well as ornamental and Christmas trees. Apply it to all susceptible new growth and leaders. Applications weather well and are effective for 2 to 6 months. One gallon (3.8 l) of liquid or 1 pound (0.45 kg) of powder costs about $32 and covers 400, 3-inch (7.6-cm) saplings or 75, 4-foot (1.2-m) evergreens.

Deer Off®. This EPA approved product is made from natural ingredients and repels deer by taste and odor. It is biodegradable, does not harm animals or the environment, and claims to last for up to 3 months.

Repel Deer from Valuable Trees and Plantings



Deer Chaser and Deer Off deliver a 1-2 punch that assaults browsing deer with odors and flavors they detest. Hung from the branches of trees and bushes, our exclusive **Deer Chaser** pouches ward off deer with a heady, citrus scent. They work in any weather, and last at least a year. If deer are hungry enough to take a bite anyway, give them a mouthful of **Deer Off Spray**. Simply spray it on the leaves of your plants and the taste of egg solids, hot pepper capsicum, and garlic will leave them wincing. Deer Off will not alter plants' appearance, nor leave any residue, and will not rinse off in the rain. Ready-to-use spray treats up to fifty 4' shrubs. Not for use on edible crops. Concentrate makes 1 gallon of spray for 4 times the coverage.

Deer Chaser, 6 pouches $26.95
Deer Off Spray, 1 qt $18.95
Deer Off Concentrate $26.95

Deer No No

Claims to be a specially formulated citrus scent in a solid cake form that is effective at repelling deer and lasts for 10-12 months. It comes in a green mesh bag and is hung next to foliage.

Hinder® (15% ammonium soaps of higher fatty acids). This area repellant is one of the few registered for use on edible crops. You can apply it directly to vegetable and field crops, forages, ornamentals, and fruit trees. Its effectiveness is usually limited to 2 to 4 weeks but varies because of weather and application technique. Reapplication may be necessary after heavy rains. For small fields and orchards, you can treat the entire area. For larger areas, apply an 8- to 15-foot (2.4- to 4.6-m) band around the perimeter of the field. Apply at temperatures above 32°F (0 o C). Four gallons (15.2 l) of liquid cost about $80, and when mixed with 100 gallons (380 l) of water will cover 1 acre (0.4 ha). Hinder is compatible for use with most pesticides.

Thiram (7% to 42% tetramethylthiuram disulfide). Thiram, a fungicide that acts as a contact (taste) deer repellant, is sold under several trade names-- Bonide Rabbit-Deer Repellant®, Nott's Chew-Not, and Gustafson 42-S®, among others. It is most often used on dormant trees and shrubs. A liquid formulation is sprayed or painted on individual trees. Although Thiram itself does not weather well, adhesives such as Vapor Gard® can be added to increase its resistance to weathering. Thiram-based repellants also protect trees against rabbit and mouse dam-age. Two gallons (7.6 l) of 42% Thiram cost about $50 and when mixed with 100 gallons (380 l) of water will cover 1 acre (0.4 ha). Cost varies with the concentration of Thiram in the product.

Miller's Hot Sauce® Animal Repellant (2.5% capsaicin). This con-tact (taste) repellant is registered for use on ornamentals, Christmas trees, and fruit trees. Apply the repellant with a backpack or trigger sprayer to all susceptible new growth, such as leaders and young leaves. Do not ap-ply to fruit-bearing plants after fruit set. Vegetable crops also can be protected if sprayed prior to the development of edible parts. Weatherability can be improved by adding an antitranspirant such as Wilt-Pruf® or Vapor Gard®. Hot Sauce and Vapor Gard® cost about $80 and $30 per gallon (3.8 l) respectively. Eight ounces (240 ml) of Hot Sauce and two quarts (1.9 l) of antitranspirant mixed with 100 gallons (380 l) of water will cover 1 acre (0.4 ha).

Tankage (putrefied meat scraps). Tankage is a slaughterhouse by-product traditionally used as a deer repellant in orchards. It repels deer by smell, as will be readily apparent. To prepare containers for tankage, remove the tops from aluminum beverage cans, puncture the sides in the middle of the cans to allow for drainage and attach the cans to the ends of 4-foot (1.2 m) stakes. Drive the stakes into the ground, 1 foot (0.3 m) from every tree you want to protect or at 6-foot (1.8-m) intervals around the perimeter of a block. Place 1 cup (225 g) of tankage in each can. You can use mesh or cloth bags instead of cans. You may have to replace the containers periodically because fox or other animals pull them down occasionally. Tankage is available by bulk ($335 per ton [$302/mt]) or bag ($20 per 50 pounds [22.5 kg]). When prepared for hanging on stakes, it costs about $0.20 per 1 ounce (28 g) bag and 300 bags will cover 2 acres (0.8 ha).

Ro-pel® (benzyldiethyl [(2,6 xylylcarbamoyl) methyl] ammonium saccharide (0.065%), thymol (0.035%). Ro-pel® is reported to repel deer with its extremely bitter taste. Apply Ro-pel® once each year to new growth. It is not recommended for use on edible crops. Spray at full strength on nursery and Christmas trees, ornamentals, and flowers. One gallon (3.8 l) costs $50 and covers about 1 acre (0.4 ha) of 8- to 10-foot (2.4- to 3.0-m) trees.

Sources for Commercial Deer Repellants

*** Some types of deer repellants may be available at your local farm supply or hardware store.**

Deer-Away® Big Game Repellant **Southern States Farmer's Supply** **Asheville, Hendersonville**	**Miller's Hot Sauce® Animal Repellant** **Unknown**
Deer Off®. **Deer Off Inc.** **58 High Valley Way** **Stamford, CT 06903** **1-800-333-7633**	**Deer Off and Deer Chaser** **Gardener's Supply Company** **128 Intervale Road** **Burlington, VT 05401** **1-800-863-1700**
Ro-pel® **Do It Yourself Pest Control** **32950 US Hwy 19 N** **Palm Harbor, FL 34684** **1-800-742-5009**	**Deer No No** **Deer No No** **P.O. Box 112** **West Cornwall, CT** **(860) 672-6264**

HOME REMEDY DEER REPELLANTS

Radio. Put a portable radio or cassette player in the yard or garden and play it at low volume. A talk show or human voices might work better than music. It can be protected from the weather by placing it in an ammo can or tupperware container perforated to allow the sound to escape.

Scented Blue Jeans. Hang several pairs of old blue jeans around the yard or around damaged plants and soak them in human urine (readily available) or coyote or mountain lion urine (which can sometimes be purchased from a local nursery or trapping supply company). The blue jeans will not smell bad once they dry. Scent must be reapplied periodically.

Plastic Bird Netting. Plastic bird netting can be hung over sensitive plants to prevent deer damage. It can often be purchased from farm supply stores or local nurseries.

Bar Soap. Recent studies and numerous testimonials have shown that ordinary bars of soap applied in the same manner as hair bags can reduce deer damage. Drill a hole in each bar and suspend it with a twist tie or soft cord. Each bar appears to protect a radius of about 1 yard (1 m). Any inexpensive brand of bar soap will work. Ready-to-use bars cost about $0.20 each.

Plastic Tape. Yellow plastic tape (3 inches in diameter) can be strung around plants 2½ to 3 feet apart. The movement of the tape can frighten deer.

Hair Bags (human hair). Human hair is an odor (area) repellant that costs very little but has not consistently repelled deer. Place two handfuls of hair in fine-mesh bags (onion bags, nylon stockings). Where severe damage occurs, hang hair bags on the outer branches of individual trees with no more than 3 feet (0.9 m) between individual bags. For larger areas, hang several bags, 3 feet (0.9 m) apart, from a fence or cord around the perimeter of the area to be protected. Attach the bags early in spring and replace them monthly through the growing season. You can get hair at local barber shops or salons.

Table 1. Ornamental plants, listed by susceptibility to deer damage

Plants Rarely Damaged:

Botanical name	Common name
Berberis spp	Barberry
Berberis vulgaris	Common Barberry
Betula papyrifera	Paper Birch
Buxus sempervirens	Common Boxwood
Elaeagnus angustifolia	Russian Olive
Ilex opaca	American Holly
Leucothoe fontanesiana	Drooping Leucothoe
Picea pungens	Colorado Blue Spruce
Pieris japonica	Japanese Pieris

Plants Seldom Severely Damaged:

Botanical name	Common name
Betula pendula	European White Birch
Calastrus scandens	American Bittersweet
Cornus sericea	Red Osier Dogwood
Cornus florida	Flowering Dogwood
Cornus kousa	Kousa Dogwood
Crataegus laevigata	English Hawthorn
Enkianthus campanulatus	Redvein Enkianthus
Fagus sylvatica	European Beech
Forsythia spp.	Forsythia
Gleditsia triacanthos	Honey Locust
Ilex cornuta	Chinese Holly
Ilex glabra	Inkberry
Juniperus chinensis	Chinese Junipers (green)
Juniperus chinensis	Chinese Junipers (blue)
Kalmia latifolia	Mountain Laurel
Kolkwitzia amabilis	Beautybush
Picea abies	Norway Spruce
Picea glauca	White Spruce
Pinus nigra	Austrian Pine
Pinus rigida	Pitch Pine
Pinus mugo	Mugo Pine
Pinus resinosa	Red Pine
Pinus sylvestris	Scots Pine
Prunus serrulata	Japanese Flowering Cherry
Salix matsudana tortuosa	Corkscrew Willow
Sassafras albidum	Common Sassafras
Syringa vulgaris	Common Lilac
Wisteria floribunda	Japanese Wisteria

Plants Occasionally Damaged:

Botanical name	Common name
Abies concolor	White Fir
Acer griseum	Paperbark Maple
Acer rubrum	Red Maple
Acer saccharinum	Silver Maple
Acer saccharum	Sugar Maple
Aesculus hippocastanum	Common Horsechestnut
Amelanchier arborea	Downy Serviceberry
Amelanchier laevis	Allegheny Serviceberry
Campsis radicans	Trumpet Creeper
Chaenomeles speciosa	Japanese Flowering Quince
Cornus racemosa	Panicled Dogwood
Cotinus coggygria	Smokebush
Cotoneaster spp	. Cotoneaster
Cotoneaster apiculatus	Cranberry Cotoneaster
Cotoneaster horizontalis	Rockspray Cotoneaster
Cryptomeria japonica	Japanese Cedar
Forsythia (x) intermedia	Border Forsythia
Hamamelis virginiana	Common Witchhazel
Hibiscus syriacus	Rose of Sharon
Hydrangea arborescens	Smooth Hydrangea
Hydrangea anomala petiolaris	Climbing Hydrangea
Hydrangea paniculata	Panicle Hydrangea
Ilex crenata	Japanese Holly

Plants Occasionally Severely Damaged (continued)

Botanical name	Comomn name
Ilex (x) meserveae	China Girl/Boy Holly
Juniperus virginiana	Eastern Red Cedar
Larix decidua	European Larch
Lonicera (x) heckrottii	Goldflame Honeysuckle
Ligustrum spp.	Privet
Magnolia (x) soulangiana	Saucer Magnolia
Metasequoia lyptostroboides	Dawn Redwood
Parthenocissus quinquifolia	Virginia Creeper
Prunus avium	Sweet Cherry
Pseudotsuga menziesii	Douglas Fir
Pyracantha coccinea	Firethorn
Pyrus calleryana 'Bradford'	Bradford Callery Pear
Pyrus communis	Common Pear
Quercus alba	White Oak
Quercus prinus	Chestnut Oak
Quercus rubra	Northern Red Oak
Rhododendron spp.	Deciduous Azaleas
Rhododendron carolinianum	Carolina Rhododendron
Rhododendron maximum	Rosebay Rhododendron
Rhus typhina	Staghorn Sumac
Rosa multiflora	Multiflora Rose
Rosa rugosa	Rugosa Rose
Salix spp.	Willows
Spiraea (x) bumalda	Anthony Waterer Spiraea
Spiraea prunifolia	Bridalwreath Spiraea
Syringa (x) persica	Persian Lilac
Syringa reticulata	Japanese Tree Lilac
Syringa villosa	Late Lilac
Tilia cordata'Greenspire'	Greenspire Littleleaf Linden
Tilia americana	Basswood
Tsuga canadensis	Eastern Hemlock
Tsuga caroliniana	Carolina Hemlock
Viburnum (x) juddii	Judd Viburnum
Viburnum rhytidophyllum	Leatherleaf Viburnum
Viburnum plicatum tomemtosum	Doublefile Viburnum
Viburnum carlesii	Koreanspice Viburnum
Weigela florida	Oldfashion Weigela

Plants Frequently Severely Damaged:

Botanical name	Comomn name
Abies balsamea	Balsam Fir
Abies fraseri	Fraser Fir
Acer platanoides	Norway Maple
Cercis canadensis	Eastern Redbud
Chamaecyparis thyoides	Atlantic White Cedar
Clematis spp.	Clematis
Cornus mas	Cornelian Dogwood
Euonymus alatus	Winged Euonymus
Euonymus fortunei	Wintercreeper
Hedera helix	English Ivy
Malus spp.	Apples
Prunus spp.	Cherries
Prunus spp.	Plums
Rhododendron spp.	Rhododendrons
Rhododendron spp.	Evergreen Azaleas
Rhododendron catawbiense	Catawba Rhododendron
Rhododendron periclymenoides	Pinxterbloom Azalea
Rosa (x) hybrid	Hybrid Tea Rose
Sorbus aucuparia	European Mountain Ash
Taxus spp.	Yews
Taxus baccata	English Yew
Taxus brevifolia	Western Yew
Taxus cuspidata	Japanese Yew
Taxus (x) media	English/Japanese Hybrid Yew
Thuja occidentalis	American Arborvitae

Wildlife Damage Management

Deer - Temporary Fencing

Peanut Butter Fence

The peanut butter fence is effective for small gardens, nurseries, and orchards (up to 3 to 4 acres [1.2 to 1.6 ha]) subject to moderate deer pressure. Deer are attracted by the peanut butter and encouraged to make nose-to-fence contact. After being shocked, deer learn to avoid fenced areas. Cost, excluding labor, is about $0.11 per linear foot ($0.30/m). This fence is not widely used.

To build a peanut butter fence follow the steps below.

(1) Install wooden corner posts.

(2) String one strand of 17-gauge (0.15-cm), smooth wire around the corners and apply light tension.

(3) Set 4-foot (1.2-m) 3/8-inch (1-cm) round fiberglass rods along the wire at 45-foot (14-m) intervals.

(4) Attach the wire to insulators on the rods 2 1/2 (0.75 m) feet above ground level and apply 50 pounds (22.5 kg) of tension.

(5) Attach 3 x 4-inch (7 x 10-cm) foil strips to the wire at 3-foot (1-m) intervals, using 1 x 2-inch (3 x 5- cm) strips of cloth adhesive tape.

(6) Apply a 1:1 mixture of peanut butter and vegetable oil to the adhesive tape strips and fold the foil over the tape.

(7) Connect the wire to the positive (+) post of a well-grounded fence charger.

(8) For fields larger than 1 acre (0.4 ha), it is more practical to apply the peanut butter mixture directly to the wire. You can make a simple applicator by mounting a free-spinning, 4-inch (10-cm) pulley on a shaft inside a plastic ice cream pail. Fill the pail with a peanut butter-vegetable oil mixture that has the consistency of very thick paint. Coat the entire wire with peanut butter by drawing the pulley along the wire. Apply peanut butter once a month. Attach foil flags to the fence near runways or areas of high deer pressure to make the fence more attractive.

Check the fence weekly for damage by deer and grounding by vegetation.

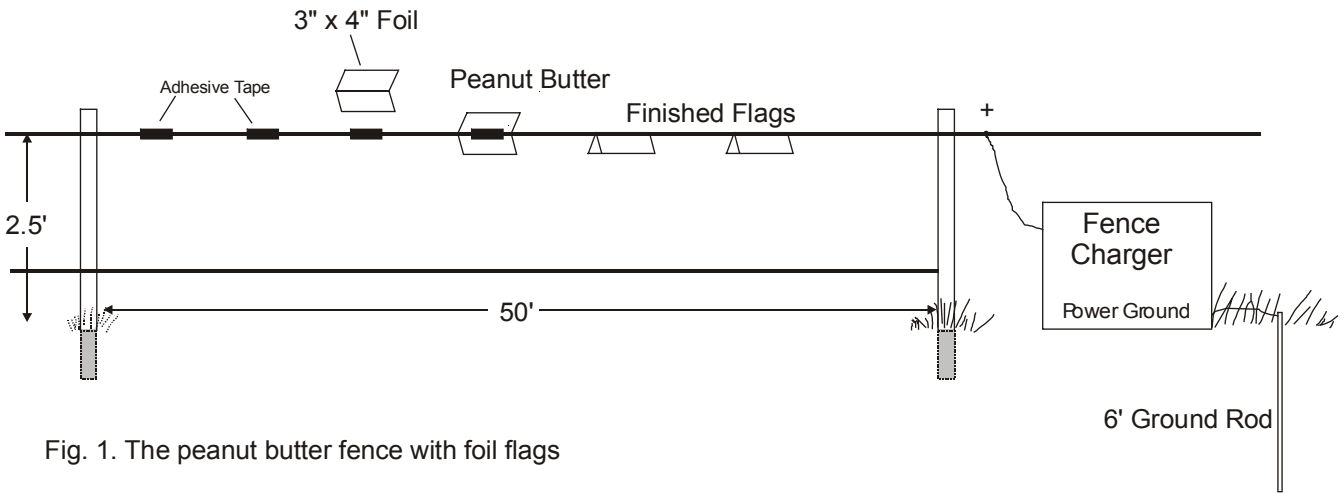


Fig. 1. The peanut butter fence with foil flags

Wildlife Damage Management

Deer - Temporary Fencing

Electric Polytape Fence

Various forms of polytape or polywire, such as Visible Grazing Systems® (VGS), Baygard®, and Turbo-tape® are very strong and portable. You can use these fences to protect up to 40 acres (16 ha) of vegetable and field crops under moderate deer pressure. Deer receive shocks through nose-to-fence contact and they learn to avoid fenced areas. Cost, excluding labor, is about $.11 per linear foot ($0.30/m).

To build a polytape fence follow the steps below.

(1) Drive 5/8-inch (1.6-cm) round fiberglass posts 2 feet (0.6 m) into the ground at the corners.

(2) String two strands of polytape (white or yellow are most visible) around the corners and apply light tension (one strand 2 1/2 feet (0.75 m) high can be used).

(3) Use square knots or half-hitches to make splices or to secure the polytape to corner posts.

(4) Set 4-foot (1.2-cm) 3/8-inch (1-cm) round fiberglass rods along the wires at 45-foot (14-m) intervals.

(5) Attach the two strands of polytape to insulators on the rods at 1 and 3 feet (0.3 and 0.9 m) above ground level and apply 50 pounds (22.5 kg) of tension.

(6) Connect the polytape to the positive (+) post of a well-grounded fence charger.

(7) Use the applicator described under Peanut Butter Fence (8) to apply 2-foot (0.6-m) swatches of peanut butter to the polytape every 6 feet (2 m) where deer presence is expected to be high.

To maintain the fence, check it weekly for damage by deer and grounding by vegetation.

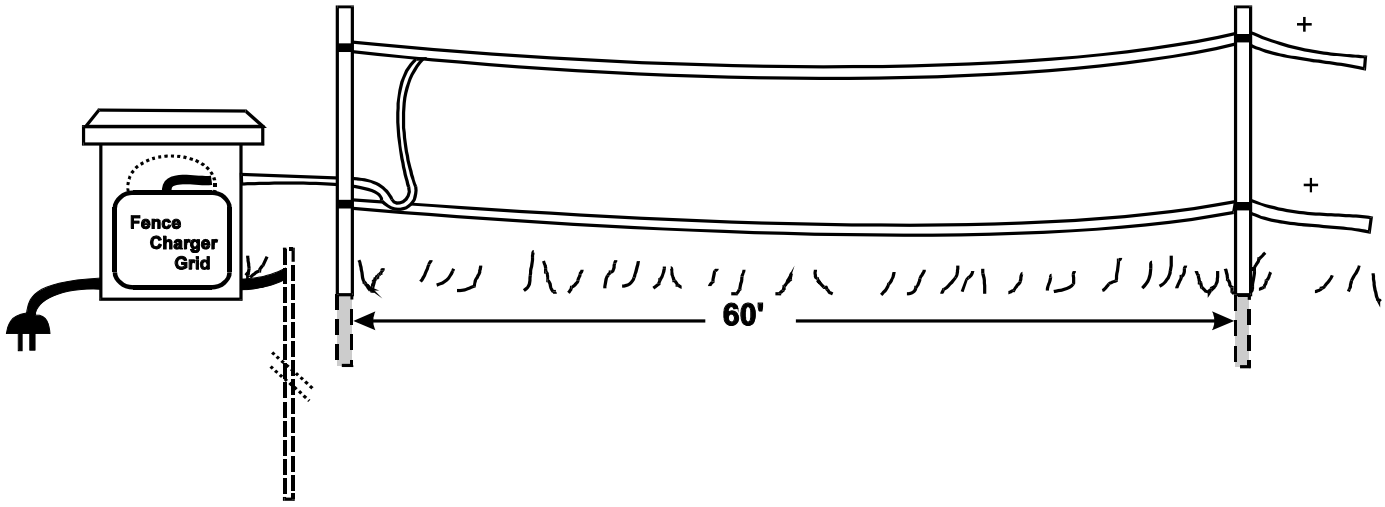


Fig. 2. The polytape fence

Premier Fence Systems
2031 300th Street
Washington, IA 52353
(800) 282-6631

Intellitape Quickfence

1 strand

Semi-permanent (1 – 30 months). For sites with low to medium deer pressure.

This is the least expensive deer barrier and the simplest to install and remove. If it is installed correctly, it repels deer much better than most would expect. Success is much more likely if it is installed before the deer are habituated to feeding or rubbing inside the enclosed area.

If possible, first install 3 strands around a small area. Then use the same materials to gradually expand the fence and reduce the number of strands to 1.

The suggested height for the tape (left) is not an error. The nose height of a walking adult deer ***is 28 – 35 inches.***

Conductor – Intellitape

Line Posts – Powerposts or Fiber rods spaced 20 – 25 feet apart

Corner/end posts – Insulated steel T posts

Energizer - Use IntelliShock units with wide impetence(284, 506, 1306, 32B, 52B, 88B).

Removal System – as many XL EzeReels as needed.

Gates – SafeHandles with Intellitape

Tools Needed – A steel post driver for end posts

Skill Level (1 – 5) – 1

To Install – 45 minutes per 1000 feet

Cost per ft. - $0.12 – 0.20

Life (yrs) – Posts 10, Tape 3

Concerns – Re-tension every 3 months. Check after storms. Bait with peanut butter every autumn.

QuickFence

3 strands of Intellitape or IntelliRope

Semi-permanent (1 – 100 months)
For sites with low to medium deer "pressure"

Conductor – IntelliRope or IntelliTape

Line Posts – Fiber rods set 10 in. deep every 25 feet for IntelliTape and 35 ft. for IntelliRope

Corner/end posts – Insulated steel T posts or 4 in. dia. Wood posts

Energizer - Use IntelliShock units with wide impetence(284, 506, 1206, 32B, 52B, 88B).

Removal System – as many XL EzeReels as needed.

Gates – 42 in. Electrostop gate

Tools Needed – A steel post driver for end posts, side-cutting pliers

Skill Level (1 – 5) – 2

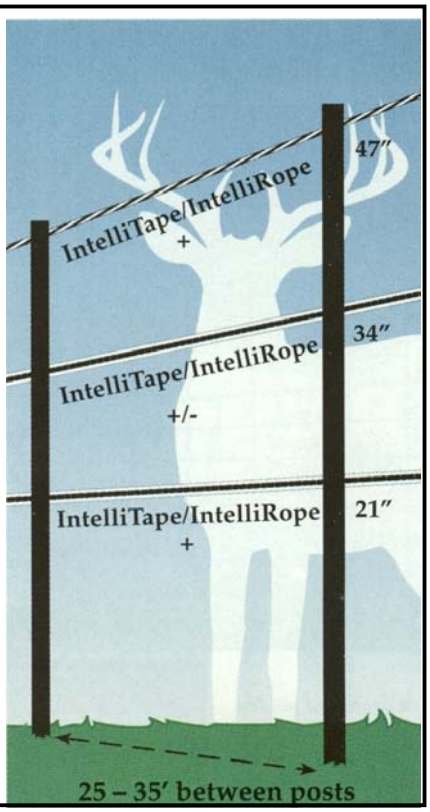
To Install – 1 hour per 1000 feet

Cost per ft. - $0.24

Life (yrs) – Posts and rope 10, Tape 3

Concerns – Re-tension strands every 6 months. Check after storms. Bait with peanut butter every autumn.

…igle strand barriers because it reduces their inclination
… an energized strand at an adult deer's nose height.
… are prone to dry soils, or snow covered soils as they
…EG format.



Wildlife Damage Management

Deer – Semi-Permanent Fencing

Electric Net Fence

Mesh fences can, in some cases, keep deer out of gardens and away from ornamental plants in yards. They are relatively easy to put up and take down, come in many different sizes, and can be fairly unobtrusive compared to other types of fencing.

Premier Fence Systems
2031 300th Street
Washington, IA 52353
(800) 282-6631

DeerGard

Semi-permanent (1 – 100 months)
For sites with medium to high deer "pressure".

High deer deterrence capability yet very simple and quick to install. Deliberately designed to offer the deer holes in the net large enough to attempt to crawl through the net. Alternate wires are charged positive and negative. Thus the deer receives a powerful, memorable, repellant shock. If the net is correctly placed and used the deer (and friends) will depart the area and not return.

Available either in "scenic " (low visibility" or high visibility colors.

Powerful electric shock intimidates deer. They are much less likely to jump over (or into) the source of pain.

Conductor(s) – A 42 in. tall prefabricated net of 10 polywires and struts

Line Posts – Built-in white struts every 12 in. Black posts every 11 ft.

Corner/end posts – Guy line posts to ground pegs

Energizer - Use IntelliShock units with wide impedance (284, 506, 1306, 32B, 52B, 88B).

Windup System – none needed. Folds & unfolds as a package.

Gates – None needed. Opens easily at any end or connection.

Tools Needed – None.

Skill needed to install – None.

To Install/remove – 10 min. per 150 ft. roll

Cost per ft. - $0.73

Life (yrs) – 8

Other – Check the fence after storms. If deer are the only concern, ask us to supply it with the lower 3 wires disconnected.

12 Volt Electric Fence Chargers

Charger with Solar Panel

Electric Deer Barrier Principles

If you ignore these issues, you may waste your time and money.

1. Electric deer barriers act on the animal's brain, not its body. Thus the best fence may fail if it is installed at the wrong time on the wrong site and managed without an awareness of how a deer herd interacts with your area and the new fence.

The only sure deer barrier is a woven wire fence or brick wall 8 ft. tall. All other deer fences involve some risk and require intelligence in placement and maintenance.

2. Deer are creatures of habit. Where they choose to feed or rub is a habit learned over time and reinforced every time they feed there safely. To exclude a deer herd from a food source forces the herd to break this habit. Thus the first day, week and month of denial is the key period. Once a feeding habit is broken, the change is usually easier to maintain.

3. Deer make "cost-benefit" decisions about preferred feeding sites, trails and rubbing trees. Pain barriers for deer use electric shock to suddenly raise the "cost" (degree of risk and effort to use an area). The goal is to persuade the deer that it is safer and less painful to feed or rub elsewhere. Do not expect success in persuading a starving deer herd to feed elsewhere if your site is its only food source.

4. Pain barriers work best when the deer are tentative. Therefore they are less successful when the animal is being chased or moving down a known trail or path.

So identify any deer trails entering the exclusion area and interrupt them with something new (brush?) where the trail approaches the fence. If at all possible, do this on the day the new fence is installed.

Also, never allow hunters to drive deer towards your fence. Terrified animals do not make normal decisions. Once deer learn that they can leap over or crawl under a fence, they're more likely to do so even when they're not terrified.

5. Don't try to repel deer from the entire area all at once. Remember, the intent is to change the herd's "mind" and thus its behavior. Therefore, install the new fence around a very small area first. Leave it in place and working for 2 weeks. The deer will encounter it, learn to avoid it and begin to regularly feed or rub in areas not enclosed by the new pain barrier.

Progressively expand the area enclosed until 100% of the area is protected. This technique allows the first fence to have 2 - 4 strands instead of 1 - 2—thus increasing the probability of eventual complete success.

6. Deer interpret a fence in their terms, not ours. Their world is not color—but black, white and shades of gray. Therefore barriers that contrast with their perceived natural world are thus the most visible and most likely to get their attention.

Deer use their noses to investigate. They see moving objects more readily than stationary objects.

7. Deer fear that which is strange and new. So, avoid using fence conductors that they already recognize and do not fear. For example, electrified steel wire fences do not deter deer in our area as woven wire, HT wire and single strand electric steel wire fences are common. IntelliTape and IntelliRope are not. Hence rope and tape work much better *in this area.*

8. Allow routes for escape. When deer encounter an electric fence, they are less likely to jump over it or crawl under it if they have alternative avenues to avoid the fence. So building the fence 6-8 ft. away from a forest provides deer space to maneuver when they suddenly receive a shock. As a result they detour around an electric fence.

9. Use a powerful fence energizer. Because of their body shape and hollow hair, deer have higher internal resistance to electricity than most animals. Thus, it requires a more powerful energizer (in joules and volts) to produce enough fear to make them avoid an area.

10. Never leave the fence unelectrified at night—not even for an hour. If you want to leave it off during the day, install a timer. However, leave it on continuously for the first month.

11. Bait the energized wires when the fence is first installed and at critical seasons of the year. It is common to wrap peanut butter inside tinfoil and hang it on the fence at 20-40 ft. intervals. The smell draws the deer's nose to fence.

12. Keep a guard dog inside the fence during critical periods. Large territorial breeds are best. If a dog is not feasible, **install flashing lights.** These lights are available from Premier on a buy and sell back policy.

Wildlife Damage Management

Deer - Permanent Fencing

Vertical Deer Fence.

Vertical fences are effective at protecting large truck gardens, orchards, and other fields from moderate to high deer pressures. Because of the prescribed wiring, deer either attempt to go through the fence and are effectively shocked or they are physically impeded by the barrier. Vertical fences use less ground space than three-dimensional fences, but are probably less effective at inhibiting deer from jumping over fences. There is a wide variety of fence materials, wire spacings, and specific designs you can use. We recommend that you employ a local fence contractor. Costs, excluding labor, range from $0.75 to $1.50 per linear foot ($2 to $4/m).

To build a 7-wire vertical deer fence follow the steps below.

(1) Install rigid corner assemblies where necessary (see the section on fence construction—rigid brace assemblies).

(2) String a 12 1/2-gauge (0.26-cm) high- tensile wire around the corner assemblies and apply light tension.

(3) Set 8-foot (2.4-m) line posts along the wire at 33-foot (10-m) intervals.

(4) Attach a wire to insulators at 8 inches (20 cm) above ground level and apply 150 to 250 pounds (68 to 113 kg) of tension.

(5) Attach the remaining wires to insulators at the spacing indicated in and apply 150 to 250 pounds (68 to 113 kg) of tension.

(6) Connect the second, fourth, fifth, and seventh wires from the top, to the positive (+) post of a well-grounded, low-impedence fence charger.

(7) Connect the top, third, and sixth wires directly to ground. The top wire should be negative for lightning protection.

(8) Clear and maintain a 6- to 12-foot (1.8- to 3.6-m) open area outside the fence so deer can see the fence.

Maintenance includes weekly fence inspection and voltage checks.

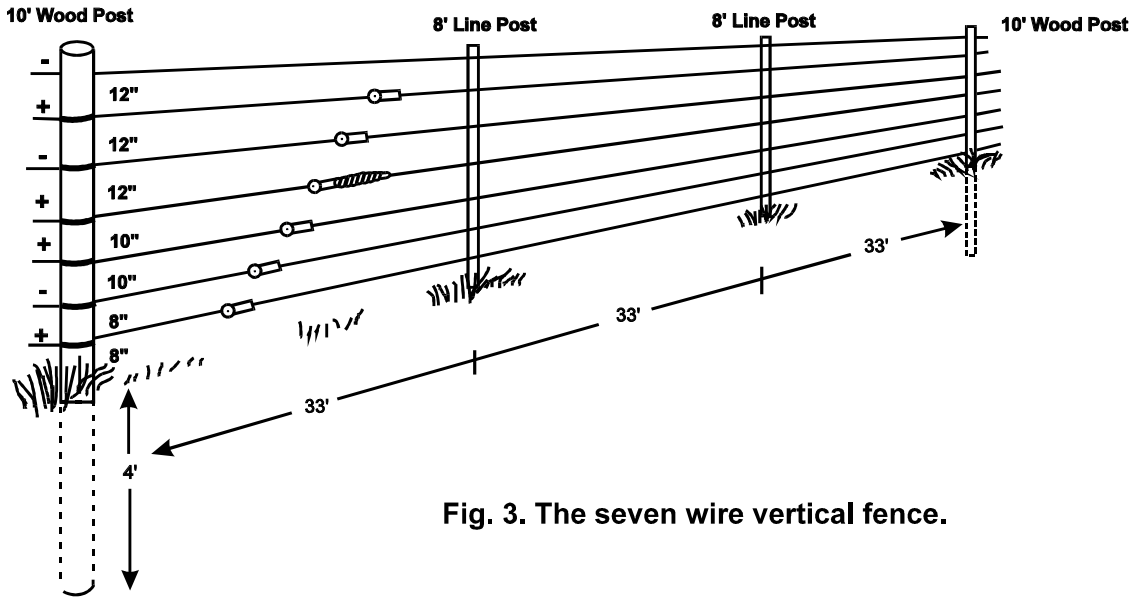


Fig. 3. The seven wire vertical fence.

Wildlife Damage Management

Deer - Permanent Fencing

Offset or Double Fence

This fence is mostly for gardens, truck farms, or nurseries up to about 40 acres (0.16 ha) that experience moderate deer pressure. Deer are repelled by the shock and the three-dimensional nature of the fence. You can add wires if deer pressure increases. Cost, excluding labor, is about $.35 per linear foot ($1/m).
To build an offset or double fence follow the steps below.

For the outside fence:

(1) Install swing corner assemblies where necessary (see the section on fence construction—rigid brace assemblies.

(2) String a 12 1/2-gauge (0.26-cm) high-tensile wire around the outside of the swing corner assemblies and apply light tension.

(3) Set 5-foot (1.5-m) line posts along the wire at 40- to 60-foot (12- to 18- intervals.

(4) Attach the wire to insulators on the line posts, 15 inches (38 cm) above ground level and apply 150 to 250 pounds (68 to 113 kg) of tension.

(5) String a second wire at 43 inches (109 cm) and apply 150 to 250 pounds (68 to 113 kg) of tension.

For the inside fence:

(6) String a wire around the inside of the swing corner assemblies and apply light tension.

(7) Set 5-foot (1.5-m) line posts along the wire at 40- to 60-foot (12- to 18- m) intervals.(8) Attach the wire to insulators on the line posts at 30 inches (76 cm) above ground level.

(9) Attach all wires to the positive (+) post of a well-grounded, low impedence fence charger.

(10) Clear and maintain a 6- to 12-foot (1.8- to 3.6-m) open area outside the fence so deer can see it.

Maintenance includes weekly fence and voltage checks.

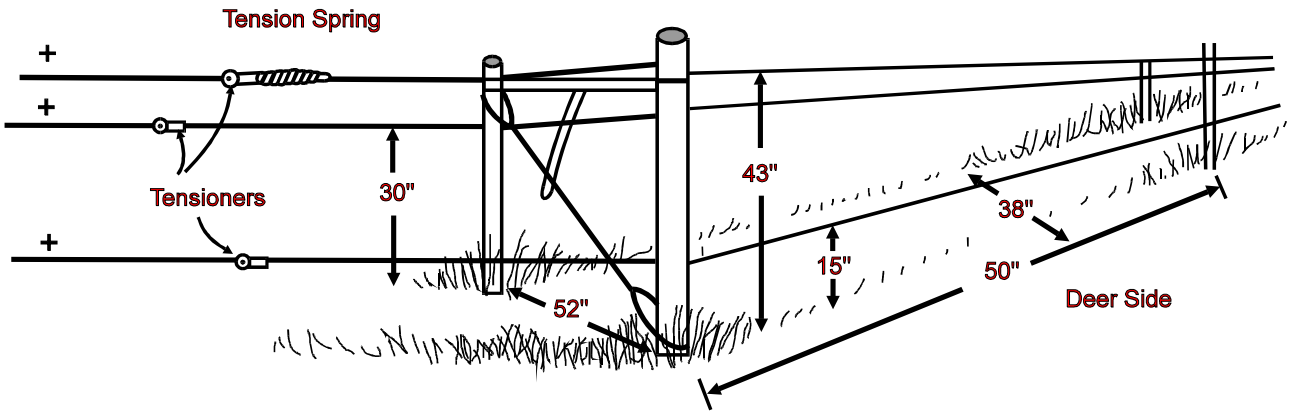


Figure 4. Offset or Double fence.

Wildlife Damage Management

Deer - Permanent Fencing

Slanted Seven-Wire Deer Fence

This fence is used where high deer pressures threaten moderate-to-large sized orchards, nurseries and other high-value crops. It presents a physical and psychological barrier to deer because of its electric shock and three-dimensional nature. Cost, excluding labor, is about $0.75 to $2 per linear foot ($2 to $5.50/m).

To build a slanted seven-wire deer fence follow the steps below.

(1) Set rigid, swing corner assemblies where necessary, (see the section on fence construction—rigid brace assemblies).

(2) String 12 1/2-gauge (0.26-cm) high-tensile wire around the corner assemblies and apply light tension.

(3) Set angle braces along the wire at 90-foot (27-m) intervals.

(4) Attach a wire at the 10-inch (25- cm) position and apply 150 pounds (68 kg) of tension.(5) Attach the remaining wires at 12-inch (30-cm) intervals and apply 150 pounds (68 kg) of tension.

(6) Place fence battens at 30-foot (9-m) intervals.

(7) Connect the top, third, fifth, and bottom wires to the positive (+) post of a well-grounded, low-impedence fence charger.

(8) Connect the second, fourth, and sixth wires from the top directly to ground.

(9) Clear and maintain a 6- to 12-foot (1.8- to 3.6-m) area outside the fence so deer can see it. Maintenance includes weekly inspection and voltage checks.

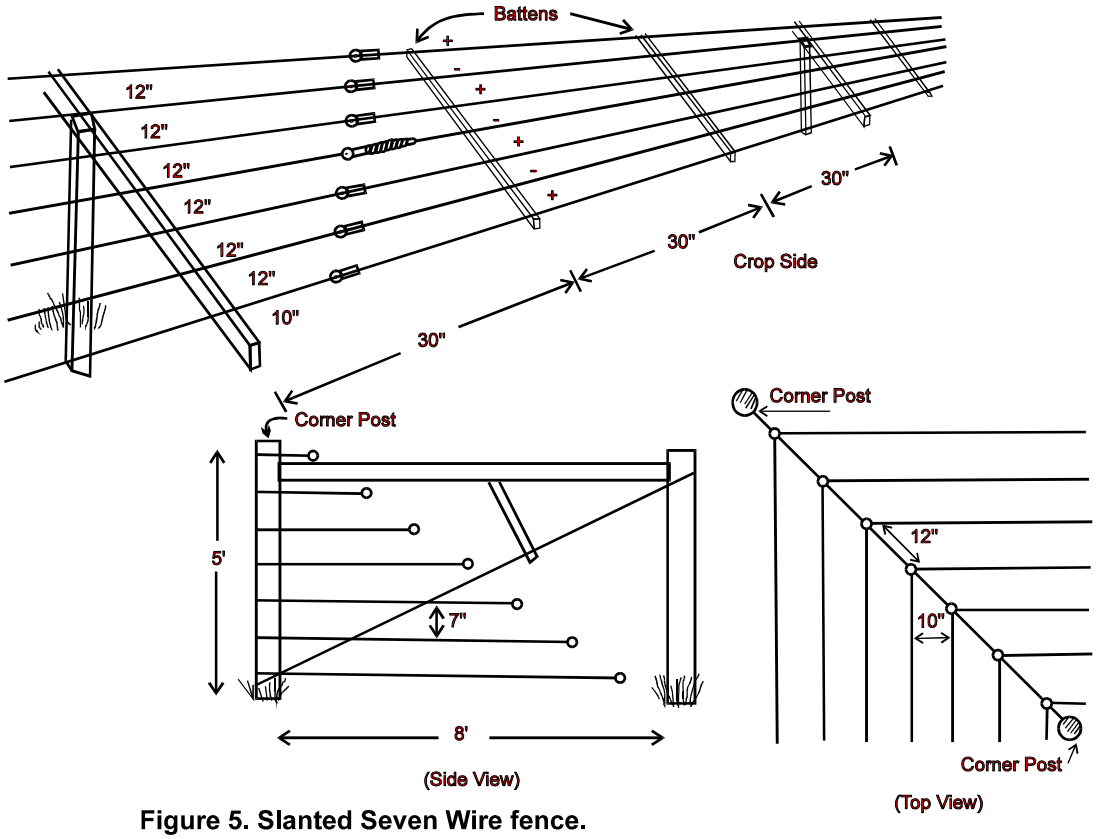


Figure 5. Slanted Seven Wire fence.

Wildlife Damage Management

Deer - Permanent Fencing

Permanent Woven-Wire Fencing

Woven-wire fences are used for year-round protection of high-value crops subject to high deer pressures. These fences are expensive and difficult to construct, but easy to maintain. Before high-tensile electric fencing, woven-wire fences were used most often to protect orchards or nurseries where the high crop value, perennial nature of damage, acreage, and 20-year life span of the fences justified the initial costs. Cost, excluding labor, is about $2 to $4 per linear foot ($5.50 to $11/m). The high cost has resulted in reduced use of woven-wire fences.

To build a deer-proof woven-wire fence follow the steps below.

(1) Set rigid corner assemblies where necessary (see the section on Fence Construction—Rigid brace).

(2) String a light wire between two corners and apply light tension.

(3) Set 16-foot (4.9-m) posts along the wire at 40-foot (12-m) intervals, to a depth of 4 to 6 feet (1.2 to 1.8 m).

(4) Roll out an 8-foot (2.4-m) roll of high-tensile woven wire along the line posts. Attach one end at ground level to a corner post with steel staples.

(5) Apply 100 pounds (45 kg) of tension to the wire with a vehicle or fence strainers and attach the wire to line and corner posts with steel staples.

(6) Repeat steps 4 and 5 as necessary around the perimeter of the fence.(7) Attach two strands of high-tensile smooth wire to the top of the fence to raise the height of the entire fence to 9 to 10 feet (2.7 to 3 m).

Minimal maintenance is required. Inspect for locations where deer can crawl under the fence.

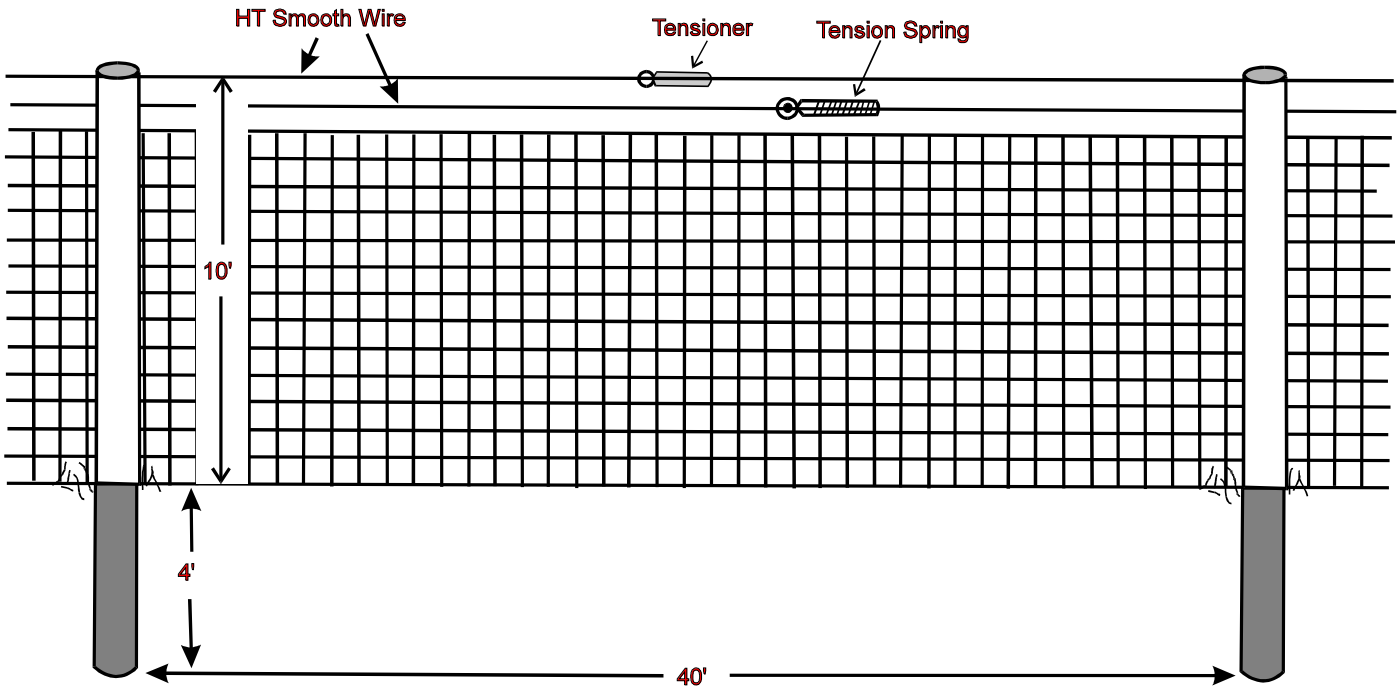


Figure 6. Permanent Woven-wire Fencing.

Wildlife Damage Management

Deer - Permanent Fencing

Fencing Tips

Materials: Do not buy cheap materials to reduce costs. This will only reduce the effectiveness and life span of the fence. We recommend using:
(1) Round fiberglass or treated wood posts.
(2) High-quality galvanized wire and steel components. For high-tensile fences, use 11- to 14-gauge (0.31- to 0.21-cm) wire (minimum tensile strength of 200,000 pounds [90,000 kg] and a minimum breaking strength of 1,800 pounds [810 kg]), tension springs, and in-line tensioners.
(3) Compression sleeves for splicing wires and making electrical connections.
(4) Lightning arresters and diverters to protect chargers.
(5) High-quality fence chargers. Chargers must be approved by Underwriters Laboratories (UL) or the Canadian Standards Association (CSA). We highly recommend 110-volt chargers. Six-and 12-volt chargers require battery recharging every 2 to 4 weeks. Use solar panels in remote areas to charge batteries continuously. For high-tensile fences, use high-voltage, low-impedence chargers only (3,000 to 5,000 volts and current pulse duration of at most 1/1,000 second).
(6) Gates. There is no universal gate design because of the many different fence types. Gates should be electrified, well insulated, and practical for the type of farming operation. Gates range from single strands of electrified wire with gate handles to electrified panel or tubular gates.

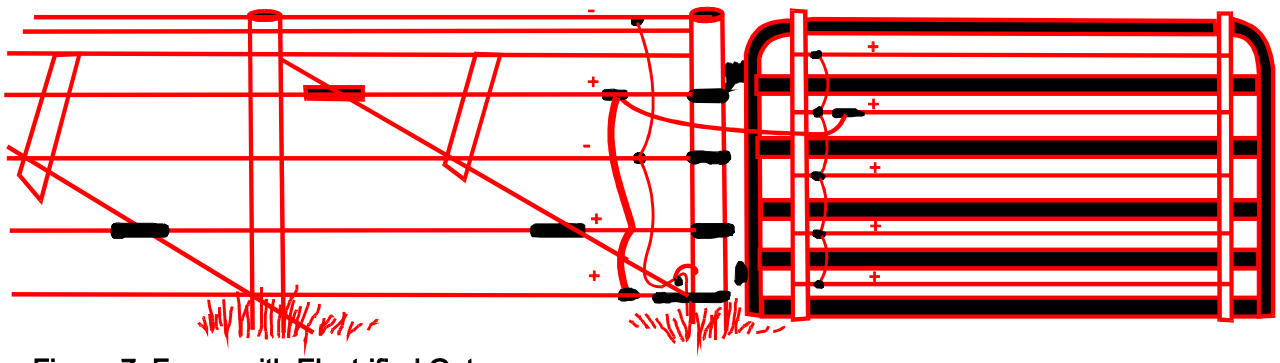


Figure 7. Fence with Electrified Gate.

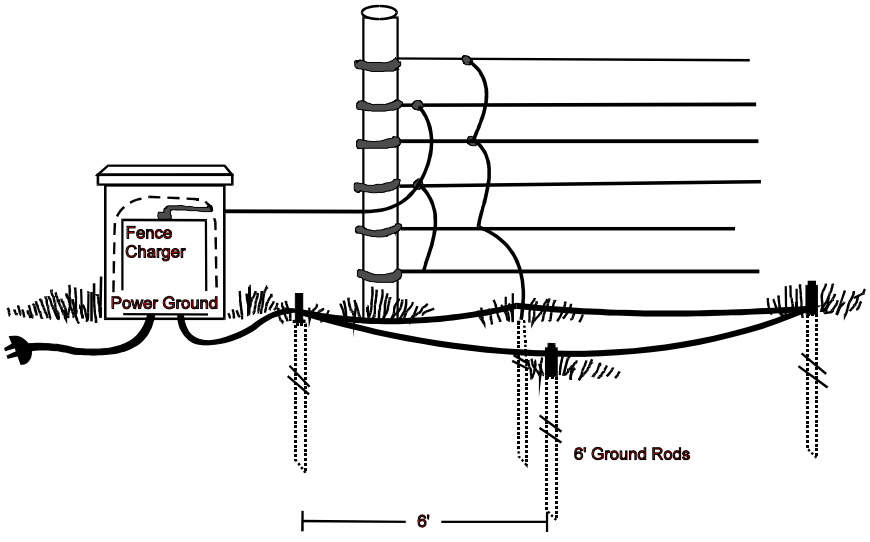


Figure 8. Electrical and grounding system for high tensile fences.

Fence Construction. Fences must be properly constructed--do not deviate from fence construction guidelines.
(1) Prepare fence lines before construction. It is easier and less expensive to install and maintain fences on clear, level runs. Minimize corners to increase strength and reduce costs.
(2) Ensure that the electrical system is well grounded at the fence charger and every 1/2 mile (880 m) of fenceline. To ground high-tensile fences, drive four to six ground rods 5 to 6 feet (1.5 to 1.8 m) deep and 6 feet (1.8 m) apart. Connect the ground post of the fence charger and the negative (-) wires of the fence to the grounding system (Fig. 1).
(3) The wiring system in figure 1 illustrates a positive-negative fence. Such a design is especially useful with dry or frozen ground. A fence with all positive (hot) wires may be advantageous under general crop and soil moisture conditions. Consult with a fencing contractor or expert for the best choice for your needs.
(4) Install the grounding systems and fence charger before fence construction. Energize completed parts of the fence when you are not working on the fence to gain early protection.
(5) Rigid brace assemblies—corners, ends, and gates—make up the backbone of all high-tensile fence systems. They must be entirely rigid, constructed of the best materials, and strictly conform to design guidelines. The single-span brace assembly is the basis of all high-tensile strainer assemblies, regardless of location in the fence or fence design. This basic design is then modified to create double-" H" braces, swing corners, and gate ends.
(6) Allow wires to slide freely through insulators on fence posts. Fence flexibility is necessary to endure frequent temperature changes, deer hits, and obstructions.
(7) Identify an electric fence with warning signs (Fig. 2) that are affixed at 300-foot (90-m) intervals or less.
Maintenance. Regular inspection and maintenance are necessary to ensure the effective operation and longevity of most fences.
(1) Control vegetation near fences by mowing or applying herbicides to avoid excessive fence grounding by weeds.
(2) On slopes or highly erodible soils, maintain a good sod cover beneath fences to avoid fenceline erosion.
(3) Always keep the fence charger on. Check the fence voltage weekly with a voltmeter. Maintain at least 3,000 volts at the furthest distance from the fence charger. Disconnect the lower wires if they are covered by snow.
(4) In late fall and early summer, ad-just the fence tension (150 to 250 pounds [68 to 113 kg]) for high-tensile fences.

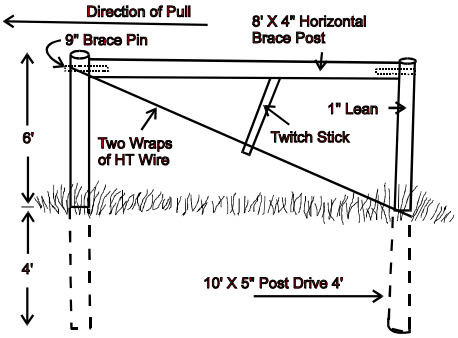


Figure 10. Single Span Brace Assembly.

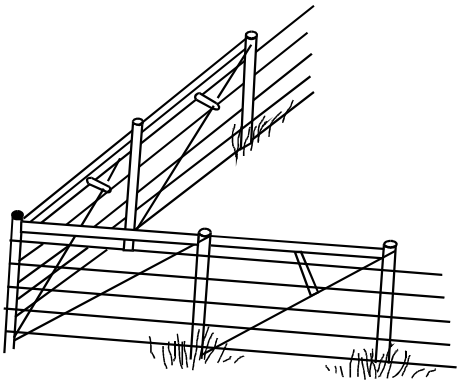


Figure 11. Double H Brace Assembly (Corner).

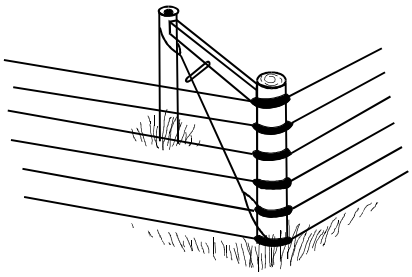


Figure 9. Swing Corner (Vertical Fence).

Figure 12. Remember to attach warning signs to your electric fence.