

Deer

Glenn Dudderar, MSU Wildlife Specialist, retired
Gary L. Heilig Horticulture Educator
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Deer Control

Woven wire fences must be at least 8 feet tall and as a result cost at approximately \$14 per foot in materials alone. Because of this expense, these fences are not the most practical alternative for orchards and tree plantations. Woven wire fences are, however, the best way to exclude deer from high risk areas, such as airports, where it is absolutely necessary to exclude all deer. In these situations, woven wire fences should be 10 feet high, or 8 feet with additional 2 feet of 3 single strands of wire 8 inches apart.

Temporary fences can be single strands of woven plastic tape and electric wires (poly tape, turbo wire) and have proven to be effective in excluding deer for 1-4 months. The wire must be capable of conducting at least 4,000 volts and should be suspended from temporary posts or stakes 2½ feet above ground level. Effectiveness rarely lasts for more than 1-4 months but that maybe sufficient for some crops. If deer begin crossing the electric tape after 1-2 months the effectiveness of the tape can be restored by putting bait on the fence, bait the fence, use 6' x 12' aluminum foil pieces smeared with a 1:1 ratio of peanut butter and peanut oil spread. Fold and hang foil pieces on the charged wire and tape them closed. These foil flags serve as an attractive device to the deer. As an alternative, roll the peanut butter and peanut oil spread directly upon the charged turbo wire. These techniques should provide effective protection against deer damage through the growing season. The fence should be removed after the threat of deer damage has ceased.

Electronic pet barriers are useful at excluding deer in areas where damage occurs. Dogs fitted with electronic collars enclosed in an area by a wire that activates the collars have reduced deer damage dramatically. When using an electronic pet barrier, the following points are vital.

- 1) The wire that activates the shock collars does not have to be buried.
- 2) Herding breeds of dogs (e.g. border collies) have been more reliable than confirmed deer-chasing mongrels.
- 3) The dogs must be trained to the wire initially. Visual indicators of the position of the wire help train the dog.
- 4) Male dogs (2 or more) are better than female dogs.
- 5) The dogs must be housed and fed within the wire.
- 6) The number of dogs needed per unit of area is unknown. Two dogs may protect 15 acre research plots. Long term effectiveness is unknown.

Electric fences will effectively exclude most deer and efficiently control deer damage if built and maintained according to the specifications described below. Improperly built and/or maintained electric fences are not effective. The most efficient configurations are the vertical 7-wire and slant 7-wire fences (see diagrams). All costs vary according to length of fence installed and variation in terrain.

In most places in Michigan, the vertical 7-wire fence will provide the most efficient protection. In areas of high deer density, the slant 7-wire configuration should be used. In uneven terrain, the slant 7-wire configuration is more expensive to build and the wide herbicide strip is subject to erosion. In northern Michigan, the slanted fence must be charged in winter or else the snow may pull it down.

Electric Deer Fence Specifications

Use high tensile strength 12.5 gauge steel wire stretched to 200-250 lbs. Use in-line wire strainers and an indicator spring to achieve proper tension. Spacing between wires and ground must be indicated at all points.

Join wires with crimping sleeves - no knots or ties.

End posts, corner posts and brace posts should be 4-5 inch diameter pressure treated wooden posts sunk 3-5 feet into the ground.

Run wire outside corners. Use sleeve indicators.

Use a Gallagher New Zealand Style energizer (high voltage, low impedance) or its equivalent. The fence charger must maintain a charge of at least 4,000 volts over the entire length of the fence.

Wires are alternately charged and make sure all chargers are properly grounded.

Make as long and straight a fence as possible. Line posts 3 inches in diameter may be spaced as much as 150 feet apart if spacing posts are used in between. Over uneven terrain, spacing posts are essential and should be spaced no more than 50 feet apart or closer when necessary to maintain the proper spacing of wires. Fiberglass line posts and spacers may also be used. Double brace end and corner posts on runs 500 feet or longer.

When erecting an electric fence, string the wires and charge them in as short a time as possible. Deer seem to learn to jump fences erected piecemeal.

Clear all vegetation away from the fence and use herbicides to keep vegetation off the fence. Vegetation touching the wires can reduce voltage enough to make the fence ineffective.

Check fence regularly to make that voltage is sufficient. Inspect fence regularly for weeds, fallen limbs and broken fence parts. Maintenance is essential!!!

Obtain a kill permit from the local DNR Field Office and immediately shoot any deer that learn to jump or step through the fence (i.e. any deer found inside the fence).

When lower wire or wires become buried in the snow, disconnect them. Otherwise, the charge on the fence is reduced.

Keep the fence charged throughout the year. Uncharged fences seem to be broken and/or ignored by deer, making them less effective when charged.

When the fence crosses traditional deer trails, add 3 extra top wires 10-12 inches apart for 10 yards on either side of the trail. The 3 extra top wires do not need to be under tension or charged. In areas of high deer density (40 or more per sq. mile), 3 extra top wires should be added to all vertical electric fences where deer are likely to jump the fence. Extra top wires are rarely necessary on sides adjacent to buildings, busy highways, ditches, etc. An electric fence should be built at least 8-10 feet inside an existing fence, if the existing fence is to remain in place. If the electric fence replaces an existing fence, the entire length of original fence should be completely taken out before the electric fence is installed.

Successful Modifications

- 1) Two MSU experiment stations report excellent deer exclusion with a vertical fence where the spacing is 6 inches between the wires after the first wire, which is 10 inches above the ground. These fences may have 9 or 10 wires charged and additional uncharged wires spaced 12 inches apart above the 9th or 10th wire, if necessary to prevent jumping.
- 2) A charged trip wire can be attached to the posts of the slant electric fence to increase its effectiveness. The wire should be attached to the posts at a height of 2 ½ feet.

Common Mistakes Made with Electric Fencing To Control Deer Damage

- 1) Failure to maintain an adequate charge (more than 4,000 volts) over the entire length of fencing and failure to use bi-polar charging.
- 2) Use of wooden posts where plastic or fiber glass spacers or posts are adequate.
- 3) Failure to maintain proper spacing between wires.

Manufacturers and Builders

Reed City Power Line Supply Co.
420 Roth Street
Reed City, MI 49677-0205
(616) 832-2297

The Wright Place
5051 Fowler Rd.
Reading, MI 49274
(517) 283-2645

Techfence
Advanced Farm Systems, Inc.
Rd. 1 Box 364
Bradford, MA 044 1 0

Invisible Fencing
PO Box 344
Leland, MI 49654-9986

Exclusion: Small individual plants in yards and gardens are best protected by encircling them with welded wire no larger than 2 X 4 inch mesh. Use smaller mesh to also exclude rabbits (1/2" mesh) and mice (1/4" mesh). Encirclements of less than 18 inches in diameter need little or no extra support. Larger encirclements of plants or group of plants need stakes for support and may not be practical because of the difficulties of construction, takedown and storage. Encircling wire should be at least 5 feet high.

Another type of exclusion is a visual barrier about 6 feet in height. Deer will not be able to see the garden vegetation and thus will not be attracted to it. A light fabric or plastic (i.e. burlap, cotton woven plastic, plastic sheets, or plastic clothes) will provide the visual barrier to keep deer away. Vertical edges of the plastic or fabric must be fastened together without gaps, and bottom edges must be weighted down.

Repellents: An excellent repellent in late summer and winter is Deer-Away which will provide almost 100% protection for 3 weeks to 3 months, depending on the number of deer, their hunger and their alternative food choices. Re-application renews effectiveness. Lightly spray or dust all parts of the plants to be protected. The liquid spray must be used when temperatures are above freezing and the dust must be applied when the plant is moist with rain, dew or frost. Apply 1 tablespoon or less to each tree. Do not use on shrubs or trees when the leaves or needles are young, growing, and succulent. Because of the limited effectiveness, Deer-Away is best used where deer damage problems are of short duration e.g. spring sprout browsing, fall antler rubbing.

Hinder can be used to repel deer from all garden vegetables, flowers, and Christmas trees. Although very effective, it must be reapplied every 2 weeks or after every rain. Mix according to label directions. Apply to the vegetation to be protected and all nearby surrounding vegetation. Again, because of the limited time of effectiveness, Hinder is economically feasible only when deer damage problems are of short duration. Other repellents such as feather meal, meat meal, soap, etc. may provide close to 100% protection for 30-90 days during the warm months (April-October) if sprinkled lightly around and on the garden vegetation; re-apply weekly. Small cloth bags of these repellents and small bars of soap when hung from trees and shrubs will repel deer from eating the trees and shrubs during the warm months. Hang these repellents from the outer branches on both sides of the plant. Renew every 90 days or more.

Other repellents which may prove helpful include garlic (Plant-Pro Tee) and denatonium benzoate (Tree Guard).

Sources of Repellents

Deer-Away County Mart 144 Hall St.
 Traverse City, MI 49684
 (616) 946-5836

Hinder Leffingwell-Uniroyal Chem
 111 S. Berry St.
 P.O. Box 1880
 Brea, CA 92621

Middle Chem.Co.
Middlebury,CT 06749
(203) 573-3411

Meat Meal Bags:
(bags, powder of meat meal)

Green Screen
Lakeshore Enterprises
2804 Benzie Hwy.
Benzonia, MI 49616

Deer Damage Control in Yards (garden, ornamental, orchards)

When deer browse woody trees and shrubs in winter, the buds, leaves and stems that they eat may quickly re-grow by the spring. If the plant suffers no loss of form, growth and production because of this re-growth, then no control is needed. If, however the injury caused by deer browsing produces a plant that is either less attractive, productive, or valuable, then damage control is necessary. The following cultural method can be used as damage control:

Cultural: Where possible, select plant species that deer rarely browse. In Michigan there are certain species of plants that deer seldom damage:

Herbaceous plants & perennial flowers that are rarely damaged may include:

<u>Common name</u>	<u>Botanical name</u>
Agave	<i>Agave</i> spp.
Allium	<i>Allium</i> spp.
Aster	<i>Aster</i> spp.
Balsam	<i>Impatiens</i> spp.
Begonia	<i>Begonia</i> spp.
Blanket Flower	<i>Gaillardia grandiflora</i>
Bleeding heart	<i>Salvia</i> spp.
Blue Fescue	<i>Festuca ovina</i> 'Glauca'
Chrysanthemum	<i>Dendranthema</i> spp.
Columbine	<i>Aquilegia</i> spp.
Coreopsis	<i>Coreopsis</i> spp.
Cranesbill	<i>Geranium</i> spp.
Crocus	<i>Crocus</i> spp.
Dahlia	<i>Dahlia</i> hybrids
Daylily	<i>Hemerocallis</i> spp.
Euphorbia	<i>Euphorbia</i> spp.
Flax	<i>Linum perenne</i>
Fleabane	<i>Erigeron</i> spp.
Forsythia	<i>Forsythia</i> spp.
Foxglove	<i>Digitalis</i> spp.
Gay-feather	<i>Liatris spicata</i>
Iris	<i>Iris</i> spp.
Lavender	<i>Lavandula angustifolia</i>
Lily-of-the-valley	<i>Convallaria majalis</i>
Lupine	<i>Lupinus polyphyllus</i>
Narcissus	<i>Narcissus</i> spp.
Pink Sea Thrift	<i>Armeria</i> spp.
Sage	<i>Salvia</i> spp.
Yarrow	<i>Achillea</i> spp.

Other plants that are seldomly damaged may include:

<u>Common name</u>	<u>Botanical name</u>
American bittersweet	<i>Celastrus scandens</i>
Beech	<i>Fagus</i>
Chinese junipers	<i>Juniperus chinensis</i>
Common lilac	<i>Syringa vulgaris</i>
Honey locust	<i>Gleditsia triacanthos</i>
Red cedar	<i>Juniperus virginiana</i>
Red osier dogwood	<i>Cornus sericea</i>
Red pine	<i>Pinus resinosa</i>

These plant names are on lists that also include *Pinus resinosa* (Red pine), *Pinus sylvestris* (Scots pine), *Cornus florida* (Flowering dogwood), *Picea abies* (Norway spruce), and *Tulipa* spp. (Tulip), are seldom damaged by deer. However, these species are consumed vigorously by deer in Michigan especially in winter. Therefore, beware of any list indicating plants "seldom" damaged by deer. Deer, especially hungry deer, will browse on almost any plant that is well fertilized, watered, and mulched.

Garden Plants-Severely Damaged

<u>Common name</u>	<u>Botanical name</u>
Beans	<i>Phaseolus</i> spp.
Broccoli	<i>Brassica oleracea italica</i>

Cabbage	<i>Brassica oleracea capitata</i>
Carrot	<i>Daucus carota sativa</i>
Cauliflower	<i>Brassica oleracea botrytis</i>
Kohlrabi	<i>Brassica oleracea</i>
Lettuce	<i>Lactuca sativa</i>
Peas	<i>Pisum sativum</i>
Spinach	<i>Spinacia oleracea</i>
Tumip	<i>Brassica rapa</i>

Garden Plants-Frequently Damaged

<u>Common name</u>	<u>Botanical name</u>
Beets	<i>Beta vulgaris</i>
Corn, sweet	<i>Zea mays</i>
Potatoes, sweet	<i>Ipomoea batatas</i>
Strawberries	<i>Fragaria i spp</i>

Garden Plants-Occasionally Damaged

<u>Common name</u>	<u>Botanical name</u>
Asparagus	<i>Asparagus officinalis</i>
Okra	<i>Abelmoschus esculentus</i>
Potatoes, Irish	<i>Solanum tuberosum</i>
Radish	<i>Raphanus sativus</i>
Squash	<i>Cucurbita pepo</i>

Garden Plants-Rarely Damaged

<u>Common name</u>	<u>Botanical name</u>
Cantaloupe	<i>Cucumis melo cantalupensis</i>
Cucumber	<i>Cucumis sativus</i>
Eggplant	<i>Solanum melongena</i>
Hot peppers	<i>Capsicum annuum</i>
Onion	<i>Allium spp.</i>
Sweet peppers	<i>Capsicum frutescens</i>
Tomato	<i>Lycopersicon esculentum</i>
Watermelon	<i>Citrulus lanatus</i>

Herbaceous Plants-Annual Flowers Rarely Damaged

<u>Common name</u>	<u>Botanical name</u>
Ageratum	<i>Ageratum houstonian</i>
Amaranth	<i>Amaranthus tricolor</i>
Castor bean	<i>Ricinus communis</i>
Cosmos	<i>Cosmos bipinnatus</i>
Chinese forget-me-not	<i>Cynoglossum amabile</i>
Cuplower	<i>Nierembergia hippoma</i>
Dusty Miller	<i>Senecio cineratia</i>
Globe amaranth	<i>Gomphrena globosa</i>
French marigold	<i>Tagetes patula</i>
Lantana	<i>Lantana spp.</i>
Ornamental pepper	<i>Capsicum annuum</i>
Periwinkle	<i>Catharanthus roseus</i>
Polygonum	<i>Polygonum capitatum</i>
Salvia	<i>Salvia viridis</i>
Sanvitalia	<i>Sanvitalia procumbens</i>
Signet marigold	<i>Tagetes tenuifolia</i>
Snapdragon	<i>Antirrhinum majus</i>
Snow-on-the-mountain	<i>Euphorbia marginate</i>
Spider flower	<i>Cleome hasslerana</i>
Stock	<i>Matthiola incana</i>

Sweet alyssum	<i>Lobularia maritima</i>
Wax begonia	<i>Begonia semperflorens</i>
Zinnia	<i>Zinnia angustifolia</i>
Zinnia	<i>Zinnia elegans</i>

Woody Plants Shrubs Rarely Damaged

<u>Common name</u>	<u>Botanical name</u>
Cranberry	
Cotoneaster	<i>Cotoneaster apiculatus</i>
Cotoneaster	<i>Cotoneaster horizontali</i>
Dawn Redwood	<i>Metasequoia</i>
Oaks	
Rockspray	

Woody Plants Shrubs Rarely Damaged

<u>Common name</u>	<u>Botanical name</u>
Allegheny	
Azaleas	<i>Rhododendron spp.</i>
Carolina	
China Boy Holly	<i>Ilex x meserveae 'China Boy'</i>
China Girl Holly	<i>Ilex x meserveae 'China Girl'</i>
Eastern White Pine	<i>Pinus strobus</i>
Firethorn	<i>Pyracantha coccinea</i>
Goldflame Honeysuckle	<i>Lonicera x heckrottii</i>
Hollies	
Hydrangeas	
Smooth Hydrangea	<i>Hydrangea aborescens</i>
Climbing Hydrangea	<i>Hydrangea anomala</i>
Hydrangea	<i>Hydrangea paniculata</i>
Japanese Cedar	<i>Cryptomeria japonica</i>
Japanese Flowering	<i>Ilex x meserveae 'China Girl'</i>
Japanese Holly	<i>Ilex crenata</i>
Japanese Tree Lilac	<i>Syringa x reticulata</i>
Lilacs	
Late Lilac	<i>Syringa villosa</i>
Maples	
Northern Red Oak	<i>Quercu Quercus a</i>
Paniculated	
Panicled Dogwood	<i>Cornus racemosa</i>
Paperbark Maple	<i>Acer griseum</i>
Pears	<i>Pyrus spp.</i>
Bradford Pear	<i>Pyrus calleryana 'Bradford'</i>
Common Pear	<i>Pyrus communis</i>
Persian Lilac	<i>Syringa x persica</i>
Privet	<i>Ligustrum spp.</i>
Quince	<i>Chaenomeles japonica</i>
Red Maple	<i>Acer rubrum</i>
Rhododendrons	
Rosebay	
Rose of Sharon	<i>Hibiscus syriacus</i>
Roses	<i>Rosa spp.</i>
Multiflora Rose	<i>Rosa multiflora</i>
Rugosa Rose	<i>Rosa rugosa</i>
Saucer Magnolia	<i>Magnolia x soulangiana</i>
Silver Maple	<i>Acer saccharinum</i>

Sugar Maple	<i>Acer saccharum</i>
Serviceberry	
Serviceberry Downy	<i>Amelanchier arborea</i>
Serviceberry	<i>Amelanchier laevis</i>
Smokebush	<i>Cotinus coggygria</i>

Woody Plants Shrubs Rarely Damaged

<u>Common name</u>	<u>Botanical name</u>
Oaks	<i>Quercus spp.</i>
Northern Red Oak	<i>Quercus rubra</i>
White Oak	<i>Quercus alba</i>
Spiraea	
Anthony Waterer	
Spiraea	<i>Spiraea x bumalda</i> 'AnthonyWaterer
Bridalwreath Spiraea	<i>Spiraea prunifolia</i>
Staghorn Sumac	<i>Rhus typhina</i>
Sweet Cherry	<i>Prunus a vium</i>
Sweet Mock Orange	<i>Philadelphus coronatus</i>
Trumpet Creeper	<i>Campsis radicans</i>
Viburnums	
Judd Viburnum	<i>Viburnum xjuddi</i>
Leather leaf	
Viburnum	<i>Viburnum rhytidophyllum</i>
Doublefile Viburnum	<i>Viburnum plicatum</i> <i>tomentosum</i>
Koreanspice	
Viburnum	<i>Viburnum cariesii</i>
Virginia Creeper	<i>Parthenocissus quinquefolia</i>
Weigela	<i>Weigela florida</i>
White Fir	<i>Abies concolor</i>
Willows	<i>Salix spp.</i>

Woody Plants - Frequently Damaged

<u>Common name</u>	<u>Botanical name</u>
Apples	
American Arborvitae	
Catawba	
Cherdes	
Clematis	
Cornelian Dogwood	
Eastern Redbud	
English Ivy	
Evergreen Azaleas	
Hybrid Tea Rose	
Norway Maple	
Peaches	
Plums	
Rhododendron	<i>Rhododendron spp.</i>
Winged Euonymus	<i>Euonymus alatus</i>
Wintercreeper	<i>Euonymus fortunei radir-ans</i>
Yews	<i>Taxus spp.</i>

Herbaceous Plants-Perennial Flowers Rarely Damaged

<u>Common name</u>	<u>Botanical name</u>
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Allium	<i>Allium spp.</i>
Amsonia	<i>Amsonia tabernaemontana</i>
Baby's-breath	<i>Gypsophila paniculata</i>
Bleeding-heart	<i>Dicentra spectabilis</i>
Butterfly weed	<i>Asclepias tuberosa</i>
Chrysanthemum	<i>Dendranthema spp.</i>
Columbine	<i>Aquilegia spp.</i>
Cc. -albells	<i>Heuchera sanguinea</i>
Coreopsis	<i>Coreopsis verticilla</i>
Flax	<i>Linum perenne</i>
Forsythia	<i>Forsythia spp.</i>
Foxglove	<i>Digitalis grandiflora</i>
Gas Plant	<i>Dictamnus albus</i>
Gay-feather	<i>Liatis spicata</i>
Globe thistle	<i>Echinops exaltatus</i>
Golden marguerite	<i>Anthemis tinctoria</i>
Grasses	many genera and species
Iris	<i>Iris spp.</i>
Lamb's ears	<i>Stachys byzantia</i>
Lavender	<i>Lavandula angustifolia</i>
Lavender cotton	<i>Santolina chamaecyparissus</i>
Lily-of-the-valley	<i>Convallaria majalis</i>
Lupine	<i>Lupinus polyphyllus</i>
Narcissus	<i>Narcissus spp.</i>
Oriental poppy	<i>Papaver orientale</i>
Rose champion	<i>Lychnis coronaria</i>
Sage	<i>Salvia farinacea</i>
Speedwell	<i>Veronica spp.</i>
Wormwood	<i>Artemisia species</i>
Yarrow	

Herbaceous Plants-Perennial Flowers Frequently Damaged

<u>Common name</u>	<u>Botanical name</u>
Tulip	<i>Tulipa spp.</i>

Woody Plants-Rarely Damaged

<u>Common name</u>	<u>Botanical name</u>
American Holly	<i>Ilex opaca</i>
Barberry	<i>Berberis spp.</i>
Common Barberry	<i>Berberis vulgaris</i>
Colorado Blue Spruce	<i>Picea pungens glauca</i>
Common Boxwood	<i>Buxus sempervirens</i>
Loblolly Pine	<i>Pinus taeda</i>
Shortleaf Pine	<i>Pinus echinata</i>
Paper Birch	<i>Betula papyrifera</i>
Russian Olive	<i>Elaeagnus angustifolia</i>

Woody Plants-Seldom Damaged

<u>Common name</u>	<u>Botanical name</u>
American Bittersweet	<i>Celastrus scandens</i>
Beautybush	<i>Kolkwitzia amabilis</i>
Cherry	<i>Prunus serotina</i>
Chinese Junipers (green)	<i>Juniperus chinensis</i> 'Pfitzerana'
Chinese Junipers (blue)	<i>Juniperus chinensis</i> 'Hetzi'

Chinese Kousa	
Common Sassafras	<i>Sassafras albidum</i>
Common Lilac	<i>Syringa vulgaris</i>
Corkscrew Willow	<i>Salix matsudana</i> 'Tortuosa'
Dogwoods	<i>Cornus kousa</i>
Red Osier Dogwood	<i>Cornus sericea</i>
Flowering Dogwood	<i>Cornus Florida</i>
Eastern Red Cedar	<i>Juniperis virginiana</i>
English Hawthorn	<i>Crataegus laevigata</i>
Forsythia	<i>Forsythia spp.</i>
Hollies	
Chinese Holly	<i>Ilex comuta</i>
Honey Locust	<i>Gleditsia triacantho</i>
Inkberry	<i>Ilex galbra</i>
Japanese Flowering	
Japanese Wisteria	<i>a floribunda</i>
Norway Spruce	<i>Picea abies</i>
Pines	
Austrian Pine	<i>Pinus nigra</i>
Mugo Pine	<i>Pinus</i>
Red Pine	<i>Pinus resinosa</i>
Scots Pine	<i>Pinus sylvestris</i>

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Woody Plants-Occasionally Damaged

<u>Common name</u>	<u>Botanical name</u>	
Basswood	<i>Tilia americans</i>	
American Basswood	<i>Tilia cordata</i> 'Green	'Greenspire'
Linden	<i>Forsythis x intermedia</i>	
Border Forsythia	'Lynwood'	
Common Witchhazel	<i>Hamamelis virginianana</i>	
Cotoneaster	<i>Cotoneaster spp.</i>	



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