

Anti-Deer Gardening Handouts from Presentation

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Deer Resistant Plants

I have worked as a landscape architect/garden designer since 1986 and have dealt with the deer situation for virtually all of that period. At my Rockland County, New York house a herd of a dozen deer will stampede through our property and the thundering of their hooves will actually make my wood frame house on its poured concrete basement physically shake. I am only a two minute car ride from Tallman Mountain State Park which is close to 900 acres, all of which is chock full of deer. Also nearby, Blauvelt Mountain State Park and also Clausland Mountain County Park at 596 and 500 acres respectively.

Indelibly etched in my memory is a Tuesday New York Times Science Section article of 25 years ago. It detailed the rising deer damage in suburban gardens. The article related that, at the turn of the previous century, that is to say AD 1900, deer were almost entirely extirpated from within the borders of New York State. The State of New York, in its infinite wisdom, took railroad boxcars out to Michigan and trapped entire deer herds. The creatures were then carted back east and 'dropped off'. Hence the rather less agreeable situation we find ourselves in today.

I do garden design in Fairfield County, Connecticut and have also dealt with the deer situation there. Below is a list of plants I have found to be effective and which I sincerely hope will be of benefit to you. I came here this evening with a firm resolution of carrying my purpose. I hope the following information has never before fallen your way but is unique and fresh.

I begin with a list of broadleaf evergreens I have found effective and have been major components in my designs for decades. Broadleaf evergreens are an absolute must in our temperate climate. They give structure to the winter garden and put to flight winter doldrums. Interestingly, before European colonization in northeastern North America the winters were not as bleak as they are today. The colonists devastated the native White Pine (*Pinus strobus*) because it was easy to carve architectural details from. Whole groves of native Hemlock (*Tsuga canadensis*) were wantonly destroyed for the tannic acid of their bark, which was used to tan leather. The fallen Hemlock logs were left to rot on the forest floor as they are poor lumber. The native broadleaf evergreen Mountain Laurel (*Kalmia latifolia*) was largely extirpated as one of its colonial English names was spoon wood.

BROADLEAF EVERGREENS:

I make a brief note here on broadleaf evergreen care and culture. All broadleaf evergreens need some degree of winter shade protection. In my opinion, and it is only my opinion, based on my observation, southwest sun is the most deleterious. Spray broadleaf evergreens with an antidesiccant product such as Wilt-Pruf in late November. Also provide an extra deep watering in late fall which can be a dry time of year in our part of the country. This will give them an extra reservoir to draw on when there is a winter thaw day. Do not plant broadleaf Rhododendrons or any Ericaceous (Heath Family) plants near Maples. They are all shallow

rooted and this creates an immediate root competition between the two groups. Maples are also allelopathic.

If you have a Norway Maple (Acer platanoides) on your property, do yourself and the planet a favor, CUT IT DOWN, IT IS AN INVASIVE non native WEED.

Never cut down native Sugar Maples (Acer saccharum).

Pieris japonica-Andromeda, Japanese Pieris: Japanese Pieris is a better common name for this species, Andromeda being an example of a defective common name. True Andromeda is Andromeda polifolia-Bog Rosemary another deer resistant heath family member. A choice broadleaf evergreen, top of the line for deer resistance; this Japanese Pieris has everything. In Japan it is called 'Asebi'. Fine textured evergreen foliage, fragrant spring flowers, and beautiful coral red/bronze color on new spring growth/foilage. This coral foliage is so effective/ornamental it is almost as if the plant is flowering a second time, in a different color. And too, there is no other broadleaf evergreen hardy in our zone 6 climat that will give such a long period of bloom. If the weather is agreeable, blooms will last for a month and a half. Many different cultivars are available. If you have limited space, try dwarf varieties. Examples of these are 'Cavatine', with a mounding habit or 'Brisbees Dwarf.' Note that Pieris japonica is not a plant for hot, dry, sunny situations near pavements and south facing buildings walls. In such places it invariably contracts the introduced Andromeda Lacebug. Spray with dormant oil in early spring when this insect is active. Do not spray dormant oil on a hot sunny day at 12.00 noon. Do your spraying in early morning, or even better, on a cloudy spring day. If you would like to plant Andromeda, and are concerned about Andromeda Lacebug susceptibility at a stress site location (driveway, patio, south facing garden or building wall), trying using

Pieris X Brouwer's Beauty: This is a hybrid between Japanese Pieris/Andromeda and our own lovely native Pieris floribunda (Mountain Pieris). It is very resistant to Andromeda Lacebug. It has similar white spring flowers to the above, not as pendulous as the flowers on Japanese Pieris.

Pieris floribunda-Mountain Andromeda: a native plant of true garden merit. Worth seeking out in the trade. Fragrant white flowers are borne upright and erect on the stems appearing less 'messy' to the eyes and taste of some gardeners. It will not attain the height of Japanese Pieris however, reaching a mature size of about 4 feet.

Prunus laurocerasus-Cherry Laurel, English Laurel: Another choice garden plant. Not the true Laurel of Greek mythological or culinary fame which is rightly called Laurus nobilis. Englishman had for centuries a proclivity for calling every broadleaf evergreen a 'Laurel', hence our native

'Mountain Laurel'. Fragrant white candle shaped flowers usually in mid-May are a perfect sequence of bloom to the aforementioned Pieris species which flowers earlier in April. ABSOLUTELY MUST HAVE SHADE PROTECTION FROM WINTER SUN!!! So a north facing building wall or a group of evergreen conifers are welcome spots. Do not plant in low lying sites with heavy clay soils that do not drain well. This plant is susceptible to phytophthera, a fungus that flourishes in wet, waterlogged soils. Also watch for a 'shot gun' fungus. Practice good sanitation if this situation occurs. Remove infected fallen leaves from ground leaf litter/duff. Dispose of infectious leaf litter in a plastic bag, NEVER COMPOST these leaves as this will cycle the fungus through your garden. Recommendations of yesteryear to destroy infected leaves and plant parts by incineration are passé as the fungus spores become airborne. Two readily available cultivars for our area are:

Prunus laurocerasus 'Otto Luyken'-'Otto Luyken' Cherry Laurel: A fine mounded form, profusely flowering with fragrant white candles. Usually attains a height of 3 to 4 feet with a much wider spread of 6 feet. Will thrive and flower in the dense shade of White Pines and Hemlocks. I really mean this.

Prunus laurocerasus 'Schipkaensis'-Skip Laurel: From my own observations and experience, not as tough/ more persnickety than the above cultivar. This cultivar is more upright narrow. I have seen this plant at 8 foot height in Nassau County, New York. It is also not as floriferous as above variety.

I recently acquired the following cultivars and was pleasantly surprised,

Prunus laurocerasus 'Parkway'-'Parkway' Cherry laurel: Did not burn this previous (2013-2014) winter in spite of two arctic vortices.

Leucothoe axillaris-Coast Leucothoe, Fetterbush: A beautiful North American native. Evergreen foliage is so elegant it has been used in floral arrangements for generations. Fragrant white flowers in May are an added bonus. Makes a good 'Facer' shrub for shrubs that tend to become leggy e. g. Rhododendron maximum (Rosebay Rhododendron) and Ilex glabra (inkberry Holly). Tends to grow lower at 2-4 foot height and is wider spreading than Leucothoe fontanesiana. This plant is in the plant family Ericaceae as is therefore a cousin of the above Pieris species as well as our native Mountain Laurel. Acid soil and shade protection are therefore beneficial. *resembles rhododendron*

Leucothoe fontanesiana (catesbei)-Drooping Leucothoe, Fetterbush, Dog-hobble: Another native species of Leucothoe. This species will grow taller than the Coast Leucothoe. Can occasionally suffer from a fungal leaf spot to which the above Coast Leucothoe is much more resistant. Plant this species only where favorable cultural conditions prevail (acid soil, shade, good air circulation) to assure success. If fungal leaf spot occurs remember good sanitation-

remove infected leaves from ground. Pinch off infected leaves that still remain on the plant. Next home for this infected material is a plastic bag in your rubbish bin.

Daphniphyllum macropodum-Daphniphyllum: A choice evergreen shrub, will be loved on your property for its deer resistance, glossy dark evergreen foliage, ergo its screening /hedgerow potential. Flowers are not of ornamental significance. Can supposedly reach 15-20' height in cultivation, much larger in the wild in its native habitat. Native to China, Korea and Japan.

Osmanthus americanus-American Osmanthus, Devilwood: Very choice native broadleaf evergreen. It has never been browsed by deer at my house. You will not write home about its small almost insignificant flowers, but they will perfume the air. The Latin name is indicative of this. Again we have an example of Greek standing in for Latin. 'Osmos' is a Greek word for fragrant, 'anthus' signifies flower. It is now about 15 feet tall in my garden where it serves to screen the property border.

Two other cold hardy and deer resistant varieties of Osmanthus hailing from the orient are

Osmanthus heterophyllus 'Goshiki'- 'Goshiki' Holly Osmanthus, Holly Tea Olive: The epithet Holly Tea Olive is apropos as it is a true member of the olive family Oleaceae. Wonderful variegated foliage. This plant has serrated leaves resembling true Hollies hence the common epithet. 'Goshiki' does in fact translate as variegated from the Japanese.

Osmanthus heterophyllus 'Gulftide'-'Gulftide' Tea Holly, Holly Osmanthus: A good doer on my property. Made it through two arctic vortices. The plants are under the shade of Hemlocks and therefore receive winter shade protection.

Illicium floridanum-Florida Anise: Perfectly hardy at my house in Tappan, New York. Very elegant olive green evergreen foliage. Foliage is sweetly pungent, perhaps the reason it is avoided by deer. The flower is a dark maroon purple with a funky aroma. Two cultivars are 'Cardinal' with showy red flowers, and 'Semmes' with clear white flowers.

Deer resistant evergreen hollies to consider are:

Ilex glabra-Inkberry Holly

Ilex opaca-American Holly

Ilex pedunculosa-Longstalk Holly

Other cold hardy deer resistant evergreens are

Mahonia bealii-Chinese Mahonia

**Berberis X gladwynensis 'Wm Penn'-
'Wm Penn' Hybrid Barberry**

Berberis julianae - Wintergreen Barberry

HOME-MADE RECIPES

3 raw eggs

3 tbs. of red hot sauce

3 tbs. of garlic juice or minced

Add enough water to a blender to process and mix well. Add this to a gallon of water and spray on plants. You can make the spray last longer by adding Will Proof to it.

Blend 2 eggs and a cup or two of cold water at high speed. Add this mixture to a gallon of water and let it stand for 24 hours. After 24 hours, spray on foliage. The egg mixture does not wash off easily, but re-application 2-3 times a season may be needed. For a larger quantity, blend a dozen eggs into 5 gallons of water. This mix is also said to repel rabbits.

6 eggs

4 hot peppers or enough to make it very hot

6-12 gloves of garlic, enough to make it stink

5 cups of warm water.

Put it all in a blender and liquify it. Put it in an old milk jug. Set it out for a couple of days in the sun to let it cook and get really stinky and hot. Strain it good if you want to use it in a sprayer. You can also pour it on and/or around the plants directly from the jug.

1 egg

1/2 cup milk

1 Tablespoon of cooking oil

1 Tablespoon of dish soap

Add 1 gallon of water and shake well. Spray or sprinkle on plants every two weeks or after heavy rain.

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Milorganite Deer Deterrent

Milorganite may enjoy success in a totally different application, in addition to being the premier turf fertilizer. For many years, Milorganite has been used to discourage deer browsing by garden centers, landscapers and golf courses in New England where it is used as both a fertilizer and a deer deterrent. Residents of many urban areas throughout the U.S. with growing numbers of deer can attest to the amount of damage browsing deer can do to shrubs and ornamental plants. Milorganite may offer some relief from deer damage and applied research has been initiated to qualify the product's effectiveness in an urban area where deer predation is a problem.

A study at Cornell University's Cooperative Extension Service, Dutchess County, New York, is attempting to quantify the result of using Milorganite as an effective deer deterrent. Thus far, the study indicates that not only is Milorganite an effective fertilizer, but is deterring deer from browsing on valuable ornamental plants and shrubs. A major television news feature on deer damage in the study area was recently reported on ABC Television's Nightly News.

For decades, Milwaukee, Wisconsin has held the title of beer capitol of the world. As quiet as it has been kept, Milwaukee has also pioneered its way through the turf grass industry with Milorganite Fertilizer. The city has produced the 100% natural organic fertilizer product, a co-product of the city's waste water treatment process, since 1926 making Milorganite the real grandfather of all fertilizers in the turf industry.

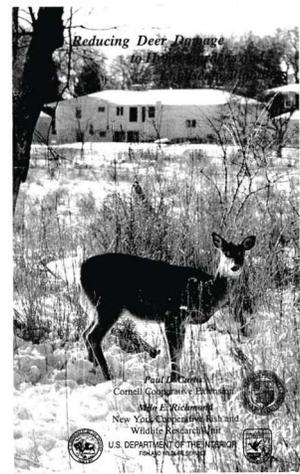
The Cornell deer study shows Milorganite had deterred deer from browsing on the Hosta and the Taxus (yews) when the fertilizer is applied around the target shrub's base. The rate of application is at 5 lbs. per 100 sq. ft. The milorganite is broadcast on the soil surface around the target plant material. According to the study, Milorganite should be applied one to two times per month and after each snowfall in the winter months. Milorganite can offer consumers its fertilizer benefits while acting as an environmentally sensitive method of discouraging deer. The researchers feel that the scent of the product may be the reason that the deer choose to browse elsewhere.

While the demonstration is still in the initial stages, the results strongly indicate that Milorganite can offer the consumer a premium natural organic fertilizer product as well as a quality, highly effective deer deterrent.

Les Hulcoop, Cooperative Extension Agent for Dutchess County who is coordinating the study said, The deer are definitely staying away from the Milorganite applications at this time. We feel that some of the commercially labeled treatments on the market do quite well in checking deer damage but the plants grow out of this protection during the spring and summer. Additionally, the users do not like the white film some of these treatments leave on the growing plant material.

Many of the deer repellent treatments lose their effectiveness in winter after temperatures fall below 10 degrees F. The study will also assess predation control if Milorganite is hung in bags from the target plants throughout the winter.

The study is to continue and data will be collected for an additional year.



Courtesy of
Tri-State Hosta Society
www.tristatehosta.org



Annuals Seldom Browsed by Deer

<i>Ageratum houstonianum</i>	Ageratum
<i>Catharanthus rosea</i>	Annual Vinca
<i>Centaurea cineraria</i>	Dusty Miller
<i>Celosia sp.</i>	Cock's Comb
<i>Centaurea cyanus</i>	Bachelor's Buttons
<i>Cleome sp.</i>	Spider Flower
<i>Consolida ambigua</i>	Larkspur
<i>Helichrysum</i>	Strawflower
<i>Heliotropium arborescens</i>	Heliotrope
<i>Lantana sp.</i>	Lantana
<i>Lobelia sp.</i>	Lobelia
<i>Lobularia maritima</i>	Sweet Alyssum
<i>Nicotiana sp.</i>	Flowering Tobacco
<i>Ocimum basilicum</i>	Basil
<i>Petroselinum crispum</i>	Parsley
<i>Salvia sp.</i>	Salvia
<i>Tagetes patula</i>	French Marigold
<i>Tropaeolum majus</i>	Nasturtium
<i>Verbena x hybrida</i>	Verbena
<i>Zinnia sp.</i>	Zinnia

Bulbs Seldom Browsed by Deer

<i>Allium sp.</i>	Ornamental Onion
<i>Camassia leichtlini</i>	Camassia
<i>Canna sp.</i>	Canna Lily
<i>Colchicum sp.</i>	Autumn Crocus
<i>Crocus sp.</i>	Crocus
<i>Eranthus hyemalis</i>	Winter Aconite
<i>Fritilaria imperialis</i>	Fritilaria
<i>Galanthus nivalis</i>	Snowdrops
<i>Gladiolus sp.</i>	Gladiolus
<i>Hyacinthus sp.</i>	Hyacinth
<i>Muscari sp.</i>	Grape Hyacinth
<i>Narcissus sp.</i>	Daffodil
<i>Oxalis sp.</i>	Wood Sorrel
<i>Scilla siberica</i>	Siberian Squill

Perennials Seldom Browsed by Deer

<i>Achillea millefolium</i>	Yarrow	<i>Perovskia atriplicifolia</i>	Russian Sage
<i>Aconitum sp.</i>	Monkshood	<i>Physostegia sp.</i>	Obedient Plant
<i>Agastache sp.</i>	Anise Hyssop	<i>Polemonium repens</i>	American Jacob's Ladder
<i>Alchemilla mollis</i>	Lady's Mantle	<i>Potentilla sp.</i>	Potentilla, Cinquefoil
<i>Allium sp.</i>	Ornamental Onion	<i>Primula sp.</i>	Primrose
<i>Anemone x hybrida</i>	Japanese Anemone	<i>Pulmonaria sp.</i>	Lungwort
<i>Aquilegia sp.</i>	Columbine	<i>Ranunculus sp.</i>	Buttercup
<i>Arabis caucasica</i>	Rock-Cress	<i>Rodgersia sp.</i>	Rodgers Flower
<i>Armeria maritima</i>	Sea Thrift	<i>Rudbeckia sp.</i>	Black Eyed Susan
<i>Artemisia dracunculoides</i>	Tarragon	<i>Ruta sp.</i>	Rue
<i>Artemisia sp.</i>	Silver Mound	<i>Salvia officinalis and S. nemorosa</i>	Sage
<i>Asarum europaeum</i>	European Ginger	<i>Santolina chamaecyparissus</i>	Lavender-Cotton
<i>Astilbe sp.</i>	Astilbe	<i>Scabiosa caucasica</i>	Pincushion Flower
<i>Aubretia deltoidea</i>	Purple Rock-Cress	<i>Solidago sp.</i>	Goldenrod
<i>Aurinia saxatilis</i>	Basket of Gold	<i>Stachys byzantina</i>	Lamb's Ear
<i>Baptisia australis</i>	False Indigo	<i>Stokesia laevis</i>	Stoke's Aster
<i>Bergenia sp.</i>	Bergenia	<i>Tanacetum vulgare</i>	Common Tansy, Painted Daisy
<i>Brunneria macrophylla</i>	Siberian Bugloss	<i>Teucrium chamaedryd</i>	Germander
<i>Cimicifuga (Actaea)</i>	Bugbane	<i>Thalictrum sp.</i>	Meadow Rue
<i>Coreopsis lanceolata and C. verticillata</i>	Coreopsis	<i>Tiarella cordifolia</i>	Foam Flower
<i>Corydalis sp.</i>	Corydalis	<i>Veronica sp.</i>	Speedwell
<i>Dicentra eximia</i>	Fringed Bleeding Heart	<i>Thymus sp.</i>	Thyme
<i>Dicentra spectabilis</i>	Bleeding Heart	<i>Yucca filimentosa</i>	Yucca
<i>Digitalis sp.</i>	Foxglove		
<i>Echinops ritro(bannaticus)</i>	Small Globe Thistle		
<i>Euphorbia sp. (except 'Chameleon')</i>	Spurge		
<i>Helleborus sp.</i>	Lenten or Christmas Rose		
<i>Iberis sempervirens</i>	Candytuft		
<i>Iris sp. (2)</i>	Iris		
<i>Lavandula sp.</i>	Lavendar		
<i>Liatris sp.</i>	Blazing Star		
<i>Ligularia 'The Rocket'</i>	Rocket Ligularia		
<i>Ligularia dentata</i>	Bigleaf Goldenray		
<i>Limonium latifolium</i>	Statice		
<i>Lobelia sp.</i>	Cardinal Flower		
<i>Lupinus sp.</i>	Lupine		
<i>Lychnis coronaria</i>	Rose Campion		
<i>Melissa officinalis</i>	Lemon Balm		
<i>Mentha sp.</i>	Mint		
<i>Mertensia virginica</i>	Virginia Bluebells		
<i>Monarda didyma</i>	Beebalm		
<i>Myosotis sp.</i>	Forget-Me-Not		
<i>Nepeta sp.</i>	Catmint		
<i>Oreganum sp.</i>	Oregano		
<i>Paeonia sp. (2)</i>	Peony		
<i>Papaver orientale</i>	Oriental Poppy		

Evergreen Trees Seldom Browsed by Deer

<i>Chamaecyparis pisifera</i>	Japanese Falsecypress
<i>Ilex opaca</i>	American Holly
<i>Juniperus virginiana</i>	Eastern Red Cedar
<i>Picea abies</i>	Norway Spruce
<i>Picea glauca</i>	White Spruce
<i>Picea omorika</i>	Serbian Spruce
<i>Picea pungens</i>	Colorado Blue Spruce
<i>Pinus densiflora</i>	Japanese Red Pine
<i>Pinus nigra</i>	Austrian Pine
<i>Pinus rigida</i>	Pitch Pine
<i>Pinus strobus</i>	Eastern White Pine
<i>Pinus sylvestris</i>	Scotch Pine
<i>Pseudotsuga menziesii</i>	Douglas Fir

Deciduous Trees Seldom Browse by Deer

<i>Acer griseum</i>	Paperbark Maple
<i>Acer palmatum</i>	Japanese Maple
<i>Acer rubrum</i>	Red Maple
<i>Acer saccharum</i>	Sugar Maple
<i>Aesculus x carnea</i>	Ruby Horsechestnut
<i>Amelanchier arborea</i>	Downy Serviceberry
<i>Amelanchier canadensis</i>	Shadbush
<i>Amelanchier laevis</i>	Allegheny Serviceberry
<i>Betula jacquemontii</i>	Himalayan Birch
<i>Betula nigra</i>	River Birch
<i>Betula papyrifera</i>	Paper Birch
<i>Betula pendula</i>	European White Birch
<i>Cercidiphyllum japonicum</i>	Katsura Tree
<i>Cornus kousa</i>	Kousa Dogwood
<i>Crataegus laevigata</i>	English Hawthorn
<i>Fagus sylvatica</i>	European Beech
<i>Fraxinus pennsylvanica</i>	Green Ash
<i>Gleditsia triacanthos</i>	Honey Locust
<i>Koelreuteria paniculata</i>	Goldenrain Tree
<i>Liriodendron tulipifera</i>	Tulip Tree
<i>Metasequoia glyptostroboides</i>	Dawn Redwood
<i>Oxydendrum arboreum</i>	Sourwood
<i>Prunus serrulata</i>	Japanese Flowering Cherry
<i>Sassafras albidum</i>	Common Sassafras

Evergreen Shrubs Seldom Browsed By Deer

<i>Andromeda polifolia</i>	Bog Rosemary
<i>Buxus sempervirens</i>	Common Boxwood
<i>Calliuna sp.</i>	Heather
<i>Cephalotaxus harringtonia</i>	Japanese Plum Yew
<i>Daphne sp.</i>	Daphne
<i>Erica sp.</i>	Heath
<i>Ilex aquifolium</i>	English Holly
<i>Ilex cornuta</i>	Chinese Holly
<i>Ilex glabra</i>	Inkberry
<i>Ilex</i> 'John T. Morris'	John T. Morris Holly
<i>Ilex</i> 'Lydia Morris'	Lydia Morris Holly
<i>Juniperus chinensis</i> 'Armstrongii'	Armstrong Juniper
<i>Juniperus chinensis</i> 'Pfitzerana'	Pfitzer Juniper
<i>Juniperus horizontalis</i> 'Youngstown'	Youngstown Andorra Juniper
<i>Juniperus horizontalis</i> 'Prince of	Prince of Wales Juniper
<i>Juniperus procumbens</i> 'Nana'	Japanese Garden Juniper
<i>Juniperus sabin</i> cv.	Savin/Tam Juniper
<i>Juniperus scopulorum</i> 'Moonglow'	Moonglow Juniper
<i>Juniperus squamata</i> 'Blue Star'	Blue Star Juniper
<i>Leucothoe fontanesiana</i>	Drooping Leucothoe
<i>Mahonia aquifolium</i>	Oregon Grape Holly
<i>Microbiota decussata</i>	Russian Cypress
<i>Pieris floribunda</i>	Mountain Pieris
<i>Pieris japonica</i>	Japanese Pieris, Andromeda
<i>Pinus mugo</i>	Mugo Pine
<i>Prunus laurocerasus</i>	Cherry Laurel
<i>Pyracantha coccinea</i>	Firethorn

Deciduous Shrubs Seldom Browsed by Deer

<i>Abelia sp.</i>	Glossy Abelia
<i>Aronia arbutifolia</i>	Red Chokeberry
<i>Berberis sp.</i>	Barberry
<i>Buddleia sp.</i>	Butterfly Bush
<i>Callicarpa sp.</i>	Beautyberry
<i>Caryopteris clandonensis</i>	Blue Mist Shrub
<i>Chaenomeles japonica</i>	Japanese Flowering Quince
<i>Clethra sp.</i>	Sweet Pepperbush
<i>Cornus alba</i>	Red Twigged Dogwood
<i>Cornus sericea</i>	Red Osier Dogwood
<i>Corylus sp.</i>	Hazelnut
<i>Cotinus coggygia</i>	Smokebush
<i>Cotoneaster apiculatus</i>	Cranberry Cotoneaster
<i>Cotoneaster dammeri</i>	Bearberry Cotoneaster
<i>Cotoneaster horizontalis</i>	Rockspray Cotoneaster
<i>Deutzia sp.</i>	Deutzia
<i>Forsythia x intermedia</i>	Forsythia
<i>Fothergilla sp.</i>	Fothergillia
<i>Halesia carolina</i>	Carolina Silverbell
<i>Hamamelis virginiana</i>	Common Witchhazel
<i>Hibiscus syriacus</i>	Rose of Sharon
<i>Hypericum prolificum</i>	St. John's Wort
<i>Ilex verticillata</i>	Winterberry Holly
<i>Itea virginica</i>	Virginia Sweetspire
<i>Kerria japonica</i>	Japanese Kerria
<i>Kolkwitzia amabilis</i>	Beautybush

<i>Lagerstroemia indica</i>	Crape Myrtle
<i>Leucothoe axillaris</i>	Coast Leucothoe
<i>Ligustrum sp.</i>	Privet
<i>Lindera benzoin</i>	Spicebush
<i>Magnolia x soulangiana</i>	Saucer Magnolia
<i>Myrica pensylvanica</i>	Bayberry
<i>Philadelphus coronarius</i>	Sweet Mock Orange
<i>Potentilla fruticosa</i>	Bush Cinquefoil
<i>Ribes sp.</i>	Currant
<i>Rhus aromatica</i>	Fragrant Sumac
<i>Sambucus sp.</i>	Elderberry
<i>Spiraea japonica</i>	Japanese Spirea
<i>Spiraea prunifolia</i>	Bridalwreath Spirea
<i>Spiraea x bumalda</i>	Anthony Waterer Spirea
<i>Symphoricarpos albus</i>	Snowberry
<i>Symphoricarpos x chenaultii</i>	Coralberry
<i>Syringa reticulata</i>	Japanese Tree Lilac
<i>Syringa vulgaris</i>	Common Lilac
<i>Viburnum carlesii</i>	Koreanspice Viburnum
<i>Viburnum dentatum</i>	Arrowwood Viburnum
<i>Viburnum opulus</i>	Cranberry Bush
<i>Viburnum plicatum tomentosum</i>	Doublefile Viburnum
<i>Viburnum prunifolium</i>	Blackhaw Viburnum
<i>Viburnum x juddii</i>	Judd Viburnum
<i>Weigela florida</i>	Weigela

Reducing Deer Damage to Ornamental and Garden Plots

Fencing

Where deer are abundant or crops are especially valuable, fencing can be an effective means of reducing deer damage. While a variety of fence types may successfully deter deer, consideration should be given to the following:

1. **Fencing as an absolute barrier** can be achieved in one of two ways. The preferred approach is the construction of at least an 8-foot-high woven-wire fence that completely encloses plants requiring protection. If deer must be kept out entirely, this is the only reliable method. Fences reaching 5, 6 or even 7 feet are useful deterrents, but do not always provide complete exclusion. The eight foot fence is expected to last 20–30 years and costs \$6 to \$8 per foot to install. Details of construction, cost, materials needed, and design information can be found in publications listed in the tables at the end of this document.

An alternative barrier that may be useful in certain circumstances consists of a smaller welded-wire fence which includes a top so that the plants to be protected are completely enclosed. This procedure may be more economical for protecting bedding plants or specialty crops such as asparagus, broccoli or perennial flowers. This approach can also be combined with other fencing deterrents to save a particular plant or high-value crop. This smaller, complete enclosure can be cost-effective for very small garden plots or isolated plantings.

Anyone who has made a significant financial commitment to the production of bedding plants, cut flowers, Christmas tree seedlings, or speciality crops of fruit or vegetables should seriously consider a woven-wire fence that is at least eight feet in height. While the initial cost is higher than that for other types of fencing, the commercial investment may only be ensured with absolute protection. Such a barrier may be practical for plots ranging from 25' x 25', up to 50 or more acres if absolute protection is warranted. A finer-mesh wire (i.e., one inch-hexagonal chicken wire or 1x2-inch welded-wire) can be added to the bottom to prevent other pests such as rabbits and woodchucks from entering the protected area. If raccoons are a problem, the addition of a single strand of electrified wire located 4 inches above ground around the outside perimeter of the fence will deter all except the most persistent animals.

The placement of an absolute barrier need not be an eyesore if attention is given to details of construction, including proper setting of corner posts, a wide gate frame for easy access, and addition of screening plants to landscape the fence. Small home-garden-sized plots may be made more accessible to tillers and small tractors by permanent construction of three sides of the fence, leaving the fourth side to be covered by a portable, removable section. Such a portable fence can be built in framed sections small enough to remove by hand if needed.

The alternative barrier for small planting beds may be a much lower fence depending upon the crop needing protection. Plants started in seedbeds may be protected with a one- or two-foot high covered fence. A practical fence of this type can be constructed by installing two parallel fences far enough apart so that one can work comfortably in between, but close enough so that a wire top and ends can be fitted into place after planting.

2. **Non-electric fences** may be sufficient to keep deer out of an area if their density is not particularly high (≤ 10 mi²) and a variety of natural foods are available. Several sizes of welded or mesh wire can be combined with additional single wires. For vegetable or flower gardeners who do not wish to lose plants to deer or other wildlife pests, we recommend a 1/2-inch welded-wire fence three feet high, with the bottom edge buried 6 inches beneath the soil. This will deter rodents, rabbits, and woodchucks from entering the area. With an additional 3 wires spaced 1 1/2 feet apart above the welded wire, this design is a suitable enclosure but not an absolute barrier for deer.

3. **Electric fences**. Several types of electric fencing provide a less expensive, yet effective alternative to the complete barrier described earlier. The polytape live-stock electrical fencing coated with peanut butter can be effective for home gardens and small nurseries or truck crops up to 40 ac. This simple, temporary fence works best under light deer pressure during summer and fall. The poly-tape fence apparently attracts deer with its bright color and peanut butter odor. Deer



Fencing continued.

make nose-to-fence contact when they approach, receiving a substantial shock and quickly learn to avoid such fenced areas. Polytape fences are portable, have a life expectancy of more than 15 years, and can be installed for \$0.10 to \$0.25 per foot. A variation of this fence substitutes a suitable repellent such as Hinder™ or Big Game Repellent™ for peanut butter, and in recent studies is shown to be even more effective at repelling deer. Certainly the combination of electronic shock with either attractants or malodorous repellents is more effective than electric fences alone.

The vertical, high-tensile electric fence is a proven deterrent to deer and is effective in 6- or 7-wire combination. Because deer choose to crawl under or step through a fence rather than jump over it, the spacing of the wire is critical. The bottom wire should be 10 inches above the ground with additional wires at 10- to 12-inch spacing to be effective.

This is a permanent fence with a 20 to 30 year lifespan. Materials include high-tensile, smooth steel wire (200,000 PSI, 12 1/2 gauge) with accessories to maintain up to 250 lbs. wire tension. A high-quality fence energizer that delivers a minimum of 5,000 volts at a maximum pulse is essential. Installation and material costs range from \$0.50 to \$1.50 per foot. Costs are reduced by increasing the area to be fenced. Identify any electric fence with warning signs placed at 100 foot intervals, with at least one sign on each fence border. For tips on construction consult a fencing contractor or references in this booklet.

A modification of the vertical fence is the slanted 7-wire electric fence which has proven effective for larger acreages. This fence is constructed in much the same way as the vertical fence but slants outward to present the deer with a more effective two-dimensional barrier. With all electric fences vegetation must be carefully controlled beneath the fence to avoid loss of power. The slanted fence requires more extensive vegetation control, and can be maintained with herbicide sprays or gas-powered weed trimmers.

Another design consists of a 3-wire combination of electrical fencing, deer repellent, and visual cue. This fence is economical, easy to build, and quite effective if maintained in good working order. Standard 7- or 8-foot wooden or steel posts, with electrical wires placed 18, 36 or 54 inches above ground, can be supplemented with 5- or 6-inch strips of cotton cloth stapled to the wires at 10-foot intervals. The cloth strips are then saturated with odor-based repellents (i.e., Hinder™ or Big Game Repellent™) and the wires are energized with at least 5,000 volts. Solar-powered charging units are available that will hold a charge for 24 hours even on cloudy days. The addition of another electrical wire 4 inches above ground will exclude most woodchucks and raccoons, but not rabbits and mice.

With electrical fencing of any design it is important to remember that:

1. A quality energizer that delivers a minimum of 5,000 volts is a must.
2. High-tensile fences require strict adherence to construction guidelines (i.e., corner assembly, wire configurations and maintenance).
3. Cost of construction decreases with increasing size of the plot to be fenced.



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Repellents

Several deer repellents are available to the home gardener, and function either as taste or odor repellents. Most commercially-available repellents can be applied as a spray to ornamental shrubs and non-bearing fruit trees. Generally, repellents are only partially effective. There is nothing on the market that provides absolute protection. Repellents are most effective when applied on a regular 4-week schedule, before serious damage has begun. They work best on plants that are low on the deer's preference list, and especially when alternate natural foods are available. Recent studies indicate satisfactory protection of perennial flower beds and some vegetable gardens by alternating the use of more than one repellent. For example, thiram applied as a spray coupled with BGR™ or Hinder™ on a cotton rope around the perimeter of the flower bed has provided good protection in a number of recent trials. Other useful combinations are still to be discovered as we seek even better ways to protect garden plantings.

Deer Away®/Big Game Repellent® (37 % commercial putrescent egg solid)

This material is primarily an odor-based repellent, and has been used extensively in western conifer plantations. It is reported to be > 85 % effective in field studies, and is registered for use on fruit trees prior to flowering, and ornamental and Christmas trees. Apply it to all susceptible new growth and leaders. Applications weather well and are effective for a minimum of 5 weeks with heavy feeding pressure by deer. A one-gallon liquid kit costs about \$26 and covers 15 to 18, 4-foot ornamental shrubs or 100-150 seedlings.

Deer-Off Repellent Spray (3.1 % egg solids, 0.0006 % capsaicin, and 0.0006 % garlic)

Deer-Off is a combination odor and taste-based product registered for use on flowers, grass, bulbs, ornamental shrubs, edible crops, plants, seedlings and trees. Deer-off is available as a spray and should be applied to all leaves, stems and branches at the beginning of each season. Treatment must be repeated after heavy rains or as new growth emerges, and if the effects of the previous treatment appear to be wearing off. A one-pint kit of deer-off costs about \$28.00, makes about 1 gallon of spray, and treats up to 200 ornamental shrubs 4 feet in height, or approximately 2,000 square feet of plants depending on surface conditions and size of plantings.

Hinder® (ammonium soaps of higher fatty acids, 13.8%)

This odor-based product is one of the few repellents registered for use on edible crops. Hinder can be applied directly to home gardens, ornamentals, annual and perennial flowers, and fruit trees until 1 week before harvest. 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. Apply at temperatures above 40°F. One gallon of liquid costs about \$40, and when mixed with 100 gallons of water will cover one acre. Hinder can also be painted full strength on the bark of trees to prevent rabbits from chewing the bark. Hinder is compatible for use with most pesticides.

Miller's Hot Sauce® Animal Repellent (2.5 % capsaicin)

This taste-based repellent is registered for use on ornamentals, fruit and nut trees, bushes, vines and hay bales stored in the field. Apply it with a backpack or trigger sprayer to all susceptible plant parts, such as leaders and young leaves. Do not apply 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 anti-transpirant such as Nu-Film-17® or Vapor Gard®. Hot Sauce and Vapor Gard® cost about \$80 and \$30 per gallon respectively. Eight ounces of Hot Sauce and 2 quarts of anti-transpirant mixed with 100 gallons of water will cover 1 acre. The 10x and 100x concentrations approved for ornamentals have effectively prevented both deer and elk damage to trees.



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Repellents continued

Nott's Chew-Not (20 % thiram)

Thiram, a fungicide that acts as a taste-based repellent, is registered for use 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 Latex 202-A® or Vapor Gard® can be added to the mixture to increase its resistance to weathering. Thiram-based repellents also protect trees against rabbit and vole damage. Two gallons of 42 percent thiram cost about \$50 and when mixed with 100 gallons of water will cover 1 acre.

Tree Guard (0.20 % dentonium benzoate)

Tree Guard is a taste-based repellent registered for use on shrubs, ornamental plants, conifers and non-bearing deciduous trees. Tree Guard is available as a ready-to-use spray and costs about \$40. One gallon will treat 16 to 20 global arborvitae 20-24" high. This product is not intended for use on food or feed crops. A recent Cornell University study indicated that this material was not effective for protecting Japanese yews from deer damage during winter.

Other Measures

The use of dogs as a frightening device is another alternative that merits attention. A dog of sufficient size and temperament may be kept on a leash near the garden and allowed to stay outdoors overnight. A number of deer damage problems have been alleviated with a system such as this. An alternative that has shown great promise in recent experiments is the use of a dog contained by a buried electrical ("invisible") fence. Such an invisible fence has great utility in keeping the dog at home, while simultaneously repelling deer from the property. More research is needed before we can recommend what breed of dog is most effective, and determine how much area one dog can protect.

Noise-making devices (i.e., exploders, sirens, whistles, etc.) are not recommended for the home garden because of the disturbance to neighbors and lack of effectiveness. Deer readily acclimate to the noise and are little disturbed after a few days of exposure.

Choice of Landscape Plantings

Homeowners are often faced with the dual problem of preventing deer from damaging a vegetable garden and/or a few fruit trees, while also protecting ornamental shrubs, flowers, and trees. In the first instance, the choice of garden plants is dictated by the owners desire for specific products, so little compromise is possible. With ornamental plants, however, the homeowner has some additional latitude in choice of species and variety, and may avert future problems and expenses by selecting landscape materials from a list of plants considered less desirable to deer. Publications describing the most- and least-preferred food plants for deer are available. Such lists may vary somewhat across broad geographic regions, but are generally reliable (Appendix A). This information can be useful both for selecting plants that are unlikely to be damaged by deer, and identifying those ornamentals that almost certainly will require protection from deer, even in areas where populations are low and feeding patterns are selective.

Excerpts taken from:

Reducing Deer Damage to Home Gardens and Landscape Plantings

**with revised repellent list*

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DEERFOOD

FOR MOST YARDS. THIS LIST CAN VARY BY HERD AND REGION.

ARBORVITAE

ASIATIC LILIES

AZALEA

CALIBROCHOA

CAMELLIA

CANDYTUFT

CHRYSANTHEMUM

CRABAPPLE

COLEUS

CROCUS

DAYLILIES

ENGLISH IVY

FLOWERING ALMOND

TROPICAL HIBISCUS

HOSTA

HYDRANGEA

IMPATIENS

LADY SLIPPER

LETTUCE AND
LEAF CROPS

MAGNOLIA

MOUNTAIN ASH

ORCHARD FRUITS

PANSY

PETUNIA

PHLOX

RHODODENDRON

ROSES

SEDUM

STAGHORN

SUMAC

SWEET PEA

SWEET POTATO

VINE

TULIP

VIOLA

WHITE PINE

WINTER GREEN

EUONYMUS

YEW

ZOWAL (ANNU)

GERANIUMS