ACKNOWLEDGMENTS

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THE STATE OF CALIFORNIA
Arnold Schwarzenegger, Governor

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L. Ryan Broddrick, Director

FRONT COVER:
Mule deer buck, Auburn, California.
Photo by Peggy Mattison.
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INTRODUCTION

Part of the appeal of living in rural or semi-rural California is the ability to watch wildlife in your own back yard. Deer are especially fascinating to observe, but many homeowners are dismayed to discover that deer can be very destructive to gardens.

In some areas the damage can be seasonal, peaking in the winter when food sources for deer are at their lowest. Other areas, where deer habitat is heavily affected by residential development, may experience problems year-round. Drought, wildfires, livestock grazing and other habitat-altering events also play a role because they affect food sources for deer.

Rural dwellers frequently ask the California Department of Fish and Game how to minimize landscape damage caused by hungry deer. This booklet details three methods:

- the use of landscape plants that deer don’t seem to like;
- application of commercial deer repellents;
- construction of deer-proof fencing.

All of the techniques are considered harmless to deer and other wild and domestic animals.
Deer are attracted to many popular garden and landscape plants but avoid others. The following list of deer-resistant plants should be considered a guide rather than the final word. Certain plants may not suffer deer damage in some gardens and landscapes, yet might be completely destroyed in others. This is due in part to the availability of natural food sources and the taste preferences of individual deer. If there is a severe shortage of natural deer browse, deer-resistant landscape plants may suffer damage.

Some of the plants listed are, in addition to being deer-resistant, considered noxious weeds. For example, bamboo is a pervasive grower and can become a significant problem because of its tendency to escape. Alternatively, native plants are better-adapted to the local climate than their exotic counterparts, and should be considered first in landscape planning.

Both native and introduced plants are listed in this booklet. The designation “some native” means some subspecies of the plant are native to California. Always consult a local nursery to select species which best fit your needs and your local climate. The Department of Fish and Game encourages use of native plant species where feasible. For example, most native perennial bunch-grasses would be suitable candidates for deer-resistant landscaping as well as being drought-resistant.

**"DEER-RESISTANT" PLANTS**

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**AQUATIC PLANT**

Bamboo (noxious)
Bamboo

**CROP/ORCHARD PLANTS**

- *Asparagus falcatus*
  - Sickle-thorn asparagus
- *Clivia miniata*
  - Kaffir lily
- *Diospyros virginiana*
  - Persimmon
- *Ficus sp.*
  - Fig
- *Gymnocladus dioica*
  - Kentucky coffee tree
- *Helianthus spp.* (some native)
  - Sunflower
- *Leptospermum sp.*
  - Tea tree
- *Olea europaea*
  - Olive
- *Punica granatum ‘Nana’*
  - Pomegranate
- *Rhubarb sp.*
  - (poisonous to livestock and humans)
  - Rhubarb
GRASSES/FORBS

Acanthus mollis
Bear's breech

Achillea sp. (some native)
Yarrow

Aconitum sp. (native)
Monkshood

Agapanthus sp.
Lily-of-the-Nile

Ageratum houstonianum
Floss flower

Ajuga sp.
Bugle weed, Carpet bugle

Amaryllis belladonna
Belladonna lily, Naked lady

Aquilegia (some native)
Columbine

Arabis sp.
Rockcress

Arctosis sp.
African daisy

Arum sp.
Arum

Asarum caudatum (some native)
Wild-ginger

Aster alpinus
Aster

Begonia tuberhybrida
Tuberous begonia

Calendula officinalis
Pot marigold

Campanula medium
Bellflower

Catharanthus roseus (Vinca rosea)
Madagascar periwinkle

Geranium tomentosum
Snow-in-summer

Chives sp.
Chives

Chrysanthemum frutescens
Marguerite, Paris Daisy

Chrysanthemum maximum
Shasta daisy

Clarkia
Godetia, Mountain garland,
Farewell to spring

Coreopsis grandiflora
Coreopsis

Coronilla varia
Crown vetch

Crocosmia sp.
Crocosmia

Cyclamen

Cymbalaria muralis
Kenilworth ivy

Cyperus

Delphinium spp. (some native)
Larkspur

Dendromecon
Bush poppy

Dicentra (native)
Bleeding heart
GRASSES/FORBS CONTINUED

Dietes vegeta
Fortnight lily

Digitalis (native)
Foxglove

Duchesnea indica
Indian mock strawberry

Epimedium (native)
Epimedium

Eschscholzia californica (native)
California poppy

Festuca ovina (native)
Sheep fescue

Fragaria chiloensis (native)
Wild strawberry, Sand strawberry

Freesia

Galium odoratum (Asperula odorata)
Sweet woodruff

Gamolepis chrysanthemoides
Gamolepis

Gerbera jamesonii
African or Transvaal daisy

Helichrysum spp.
Strawflower

Hellebores spp.
Hellebore

Hemerocallis
Daylily

Herbs, except Basil

Hippophae rhamnoides
Sea buckthorn

Hosta (Funkia)
Plantain lily

Hypericum
St. Johnswort

Iris spp. (some native)
Iris

Ixia maculata
African corn lily

Jasminum spp.
Jasmine

Kniphofia uvaria
Redhot poker, Torch-lily, Poker plant

Lamium maculatum (noxious)
Dead nettle

Laurentia fluviatilis
Blue star creeper

Leucojum spp.
Snowflake

Liriope
Lilyturf

Lobelia (native)
Lobelia

Lychnis coronaria
Crown-pink, Mullein-pink

Lysimachia nummularia
Moneywort, Creeping jennie

Mentha
Mint

Mirabilis jalapa
Four o’clock

Moluccella laevis
Bells-of-Ireland

Monarda
Bee balm, Oswego tea
**GRASSES/FORBS CONTINUED**

<table>
<thead>
<tr>
<th>Myosotis spp.</th>
<th>Soleirolia soleirolli</th>
</tr>
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<tbody>
<tr>
<td>Forget-me-not</td>
<td>Baby’s tears, Angel’s tears</td>
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</table>

<table>
<thead>
<tr>
<th>Narcissus spp.</th>
<th>Sparaxis tricolor</th>
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<tbody>
<tr>
<td>Narcissus, Daffodil, Jonquil</td>
<td>Harlequin flower</td>
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<table>
<thead>
<tr>
<th>Nepeta</th>
<th>Stachys byzantina</th>
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<tbody>
<tr>
<td>Catnip</td>
<td>Lamb’s ears</td>
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<thead>
<tr>
<th>Ophiopogon japonicus</th>
<th>Streptisza reginae</th>
</tr>
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<tbody>
<tr>
<td>Lily turf</td>
<td>Bird of paradise</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Paeonia suffruticosa</th>
<th>Teucrium fruticans</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tree peony</td>
<td>Bush germander</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Papaver rhoeas</th>
<th>Tolmiea menziesii (native)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flanders field poppy, Shirley poppy</td>
<td>Piggy-back plant</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Papaver orientale</th>
<th>Tradescantia spp.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oriental poppy</td>
<td>Spiderwort, Wandering Jew</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Papaver nudicaule</th>
<th>Trillium spp. (some native)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Iceland poppy</td>
<td>Trillium, Wake-robin</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Penstemon spp. (some native)</th>
<th>Tulipa spp.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Penstemon, Beard tongue</td>
<td>Tulip</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Phormium tenax</th>
<th>Valeriana officinalis</th>
</tr>
</thead>
<tbody>
<tr>
<td>New Zealand flax</td>
<td>Valerian, Garden heliotrope</td>
</tr>
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<table>
<thead>
<tr>
<th>Romneya coulteri (native and rare)</th>
<th>Vallota speciosa</th>
</tr>
</thead>
<tbody>
<tr>
<td>Matilija poppy</td>
<td>Scarborough lily</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Rudbeckia hirta</th>
<th>Verbena (native)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gloriosa daisy, Black-eyed Susan</td>
<td>Verbena</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Scabiosa spp.</th>
<th>Vinca spp. (some native)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pincushion flower</td>
<td>Periwinkle</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Scilla peruviana</th>
<th>Zantedeschia spp.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Peruvian scilla</td>
<td>Calla lily</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Silene acaulis</th>
<th>Zinnia</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cushion pink, Moss campion</td>
<td>Zinnia</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Sisyrinchium (native)</th>
<th>Abutilon (native)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blue-eyed grass</td>
<td>Flowering maple, Chinese lantern</td>
</tr>
</tbody>
</table>
A Gardener’s Guide to Preventing Deer Damage

SHRUBS

*Acer circinatum* (native)
Vine maple

*Agave spp.* (some native)
Century plant

*Alcea rosea*
Hollyhock

*Aralia spinosa*
Devil’s walkingstick, Hercules’ club, Angelica tree

*Arctostaphylos uva-ursi,* and other species (some native)
Bearberry, Kinnikinnick

*Baccharis pilularis* (native, also noxious)
Coyote brush, Dwarf chaparral broom

*Berberis* (some native)
Barberry

*Brugmansia (Datura)*
Angel’s trumpet

*Brodiaea* (native)
Brodiea

*Buddleia davidii*
Butterfly bush, Summer lilac

*Busax spp.*
Boxwood

*Cactaceae* (some native)
Cactus, many species and varieties

*Calliandra tweedii*
Trinidad female bush, Brazilian flame bush

*Callistemon*
Bottlebrush

*Callycanthus occidentalis* (native)
Spice bush

*Caragana arborescens*
Siberian peashrub

*Caragana arborescens*
Siberian peashrub

*Callista*

*Choisya ternata*
Mexican orange

*Cissus rhombifolia*
Grape ivy

*Cistus*
Rockrose

*Clematis* (some native)
Clematis
### SHRUBS CONTINUED

<table>
<thead>
<tr>
<th>Scientific Name</th>
<th>Common Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clianthus puniceus</td>
<td>Parrot-beak</td>
</tr>
<tr>
<td>Coleonema pulchrum</td>
<td>Pink breath of heaven</td>
</tr>
<tr>
<td>Coprosma repens</td>
<td>Mirror plant</td>
</tr>
<tr>
<td>Corokia cotoneaster</td>
<td>Corokia cotoneaster</td>
</tr>
<tr>
<td>Corolla spp.</td>
<td>Australian fuchsia</td>
</tr>
<tr>
<td>Cotoneaster buxifolius</td>
<td>Cotoneaster</td>
</tr>
<tr>
<td>Cycas revoluta</td>
<td>Sago palm</td>
</tr>
<tr>
<td>Daphne spp.</td>
<td>Daphne</td>
</tr>
<tr>
<td>Datura</td>
<td>Jimson Weed</td>
</tr>
<tr>
<td>Diosma</td>
<td>Salal, Lemon leaf</td>
</tr>
<tr>
<td>Coleonema</td>
<td>Gaultheria shallon (native)</td>
</tr>
<tr>
<td>Dodonaea viscosa</td>
<td>Hop bush, Hopseed bush</td>
</tr>
<tr>
<td>Echium fastuosum</td>
<td>Pride of Madeira</td>
</tr>
<tr>
<td>Elyagnus pungens</td>
<td>Silverberry</td>
</tr>
<tr>
<td>Erica</td>
<td>Hedera helix (noxious)</td>
</tr>
<tr>
<td>Eriogonum (some native)</td>
<td>Toyon, Christmas berry,</td>
</tr>
<tr>
<td>Escallonia spp.</td>
<td>Escallonia</td>
</tr>
<tr>
<td>Griselinia lucida</td>
<td>Griselinia</td>
</tr>
<tr>
<td>Hedera helix</td>
<td>English ivy</td>
</tr>
<tr>
<td>Heteromeles arbutifolia (native)</td>
<td>California holly</td>
</tr>
<tr>
<td>Hibbertia scandens</td>
<td>Guinea gold vine</td>
</tr>
</tbody>
</table>

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A Gardener’s Guide to Preventing Deer Damage
SHRUBS CONTINUED

*Impatiens wallerana*  
Busy Lizzie

*Lachromia cyaneum*  
Lachroma

*Kerria japonica*  
Japanese rose

*Lantana montevidensis*  
Trailing lantana

*Lavandula*  
Lavender

*Leonotis leonurus*  
Lion’s tail

*Loropetalum chinense*  
Loropetalum

*Lupinus* (some native)  
Lupine

*Mahonia spp.* (some native)  
Mahonia, Oregon grape

*Melianthus major*  
Honey bush

*Mimulus*  
Monkey flower

*Muehlenbeckia complexa*  
Mattress vine, Wire vine

*Myoporum laetum*  
Myoporum

*Myrtus californica*  
Wax myrtle

*Nandina domestica*  
Heavenly bamboo

*Nerium oleander*  
Oleander

*Nolina parryi* (native)  
Nolina

*Osteospermum fruticosum*  
Trailing african daisy, Freeway daisy

*Oxalis oregana*  
Oregon Oxalis, Redwood sorrel

*Pandorea pandorana*  
Wonga-wonga vine

*Phaedranthus buccinatorius*  
Blood red trumpet vine

*Phlomis fruticosa*  
Jerusalem sage

*Plumbago auriculata*  
Cape plumbago

*Potentilla fruticosa* (native)  
Shrubby cinquefoil

*Raoulia australis*  
Raoulia

*Rhododendron—except azaleas* (native)  
*R. macrophyllum, R. occidentalis*

*Rhus ouata* (native)  
Sugar bush

*Rhus ovata* (native)  
Sugar bush

*Ribes* (native)  
Currant, Gooseberry

*Rosmarinus officinalis*  
Rosemary

*Ruscus aculeatus*  
Butcher’s broom

*Sambucus* (native)  
Elderberry

*Santolina*  
Santolina
SHRUBS CONTINUED

Senecio cineraria
Dusty miller

Symphoricarpos albus (native)
Common snowberry

Syringa vulgaris
Common lilac

Syzygium paniculatum
Bush cherry, Australian brush cherry

Tecomaria capensis
Cape honeysuckle

Trachelospermum jasminoides
Star jasmine

Yucca spp. (some native)
Yucca, Spanish bayonet

Zauschneria spp. (some native)
California fuchsia, Hummingbird flower

TREES

Abies (some native)
Fir

Acer macrophyllum (native)
Bigleaf maple

Acer palmatum
Japanese maple

Acer negundo (native)
Box elder

Agonis flexuosa
Peppermint tree

Albizia
Silk tree, Plume acacia

Angophora costata (A. lanceolata)
Gum myrtle

Araucaria spp.
Araucaria

Arbutus unedo
Strawberry tree

Arbutus menziesii (native)
Madrone, Madrono

Beaucarnea recurvata
Ponytail, Bottle palm

Brachychiton populneus
Bottle tree

Calocedrus decurrens (native)
Incense cedar

Cassuarina stricta
Mountain or Drooping she-oak, Coast beefwood

A Gardener's Guide to Preventing Deer Damage
<table>
<thead>
<tr>
<th>Common Name</th>
<th>Scientific Name</th>
<th>Deer Damage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Common catalpa</td>
<td>Catalpa bignonioides</td>
<td></td>
</tr>
<tr>
<td>Indian bean</td>
<td>Fraxinus velutina (native)</td>
<td>Arizona ash</td>
</tr>
<tr>
<td>Cedar</td>
<td>Cedrus</td>
<td>Gagetes spp.</td>
</tr>
<tr>
<td>European hackberry</td>
<td>Celtis australis</td>
<td>Marigold</td>
</tr>
<tr>
<td>Carob, St. John’s bread</td>
<td>Ceratonia siliqua</td>
<td>Ginkobiloba</td>
</tr>
<tr>
<td>Western redbud</td>
<td>Cercis occidentalis (native)</td>
<td>Maidenhair tree</td>
</tr>
<tr>
<td>False cypress</td>
<td>Chamaecyparis sp. (native)</td>
<td>Hakea suaveolens</td>
</tr>
<tr>
<td>Mediterranean fan palm</td>
<td>Chamaerops humilis</td>
<td>Sweet hakea</td>
</tr>
<tr>
<td>Evergreen or Himalayan dogwood</td>
<td>Cornus capitata</td>
<td>Ilex (except thornless)</td>
</tr>
<tr>
<td>Western hazelnut</td>
<td>Corylus cornuta californica (native)</td>
<td>Holly</td>
</tr>
<tr>
<td>Smoke tree</td>
<td>Cordyline australis</td>
<td>Juniperus (some native)</td>
</tr>
<tr>
<td>European larch</td>
<td>Dracaena palm</td>
<td>Juniper</td>
</tr>
<tr>
<td>Guadalupe palm</td>
<td>Erythea edulis</td>
<td>Larix decidua</td>
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<tr>
<td>Osage orange</td>
<td>Fraxinus velutina (native)</td>
<td>Liquidambar styraciflua</td>
</tr>
<tr>
<td>Magnolia</td>
<td>Magnolia spp. (some native)</td>
<td>American sweet gum</td>
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<tr>
<td>Osage orange</td>
<td>Corylus cornuta californica (native)</td>
<td>Liquidambar styraciflua</td>
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<tr>
<td>Catalina ironwood</td>
<td>Lyonothamnus floribundus (native)</td>
<td>Magnolia</td>
</tr>
<tr>
<td>Maclura pomifera</td>
<td>Maclura pomifera</td>
<td>Mayten tree</td>
</tr>
<tr>
<td>Mayten tree</td>
<td>Magnolia spp.</td>
<td>Maytenus boaria</td>
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<tr>
<td>Cajeput tree</td>
<td>Magnolia</td>
<td>Melaleuca leucadendra</td>
</tr>
<tr>
<td>China-berry</td>
<td>Maytenus boaria</td>
<td>Melia azedarach</td>
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A Gardener’s Guide to Preventing Deer Damage
### TREES CONTINUED

<table>
<thead>
<tr>
<th>Tree Name</th>
<th>Native Status</th>
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<tbody>
<tr>
<td>Metrosideros excelsus</td>
<td></td>
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<tr>
<td>New Zealand Christmas tree</td>
<td></td>
</tr>
<tr>
<td>Michelia figo</td>
<td></td>
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<tr>
<td>Banana shrub</td>
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<tr>
<td>Myrtus communis</td>
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<tr>
<td>True myrtle</td>
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<tr>
<td>Parkinsonia aculeata</td>
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<tr>
<td>Jerusalem thorn, Mexican palo verde</td>
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<tr>
<td>Paulownia tomentosa</td>
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<td>Empress tree</td>
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<td>Phoenix spp.</td>
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<td>Date palm</td>
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<td>Picea spp. (some native)</td>
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</tr>
<tr>
<td>Spruce</td>
<td></td>
</tr>
<tr>
<td>Pinus spp. (some native)</td>
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<td>Pine</td>
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<tr>
<td>Pittosporum spp.</td>
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<td>Pittosporum</td>
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<tr>
<td>Platanus racemosa (native)</td>
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<tr>
<td>California sycamore</td>
<td></td>
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<tr>
<td>Podocarpus</td>
<td></td>
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<tr>
<td>Fern pine</td>
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</tr>
<tr>
<td>Prunus caroliniana and other spp. (some native)</td>
<td>Carolina laurel cherry</td>
</tr>
<tr>
<td>Soapbark tree</td>
<td></td>
</tr>
<tr>
<td>Robinia pseudoacacia</td>
<td></td>
</tr>
<tr>
<td>Black locust</td>
<td></td>
</tr>
<tr>
<td>Sabal</td>
<td></td>
</tr>
<tr>
<td>Palmetto</td>
<td></td>
</tr>
<tr>
<td>Schinus molle</td>
<td></td>
</tr>
<tr>
<td>California pepper tree</td>
<td></td>
</tr>
</tbody>
</table>

*California bay laurel*
DEER REPELLENTS

Various types of devices and chemicals have been used to repel deer including scare devices, over-the-counter repellent sprays and powder, and home remedies. Scare devices such as exploders, radios, lights, and even a dog on a leash have short-term limited effectiveness at best. Home remedies such as hanging bags of hair, soap, rotten eggs or animal urine are not trustworthy, long-term repellents. Over-the-counter repellents have been the most successful deterrent for non-commercial users experiencing light to moderate damage. However, repellents must be applied frequently and vigilantly prior to and during the period of anticipated damage in order to be effective. For example, repellents should be applied to plants prior to planting and reapplied during the growing season. * ‘Hinder,’ which is a mixture of ammonium soaps, and ‘Deer Away,’ made from putrescent whole egg solids have been the most widely used and effective repellent sprays. Other repellents available are:

REPEL ANIMAL REPELLENT
Farnam Co. Inc.
301 W. Osborn Rd.
Phoenix, AZ 85013
(800) 825-2555

HOT SAUCE ANIMAL REPELLENT
Miller Chemical & Fertilizer Corp.
P.O. Box 333
Hanover, PA 17331

HINDER
Crompton Chemical
UAP Great Lakes
LaCrescent, MN
(507) 895-2103

**DEER AWAY
Intagra, Inc.
8500 Pillsbury Ave. South
Minneapolis, MN 55420
(612) 881-5535

NATIONAL DEER REPELLANT
National Scent
P.O. Box 667
San Jacinto, CA 92581
(909) 654-2442

* Consult individual manufacturers for proper spray concentration and application.
** Deer Away is not approved for application on edible crops.
FENCING APPLICATIONS

For nurseries, orchards, pastures, and large gardens, fencing is often the only way to prevent damage from animals. Many of the fencing options discussed on the following pages also work well for small gardens because they are easy to build and very cost-effective. The following fencing designs are the primary methods being used by professional game managers and many state and federal agencies to control damage from both livestock and wild animals.

HIGH-TENSILE WIRE FENCE

By far, the most effective and most maintainable new fencing used are the New Zealand-designed high-tensile wire fences (See FIGURE A, page 19). Although the initial cost is high, this type of fence requires the least maintenance, and thus the cost per ft/yr is the lowest of all discussed. The fence uses smooth wire instead of barbed wire which is tensioned using a ‘strainer’ device. The strength of this type of fencing is in the tension applied. Animals cannot “squeeze” through the fence.

Although construction is somewhat technical, the fence actually takes less labor to install because line posts are only needed every 25-50 ft. Proper construction of the “H-brace” corners is critical since the twelve wires used exert tremendous pressure on the corners (See FIGURE B, page 20). The horizontal wires can be spaced varying distances apart (usually from 4-6 inches) and separated by fiberglass or wooden ‘droppers’ (similar to stays) every five feet. The bottom wire is placed 6 in. off the ground. Tension is applied using a rachet tool and must be periodically adjusted for the fence to function effectively. Because construction is highly specialized, the manufacturer should supply instructions when purchasing materials.

ELECTRIFIED HIGH-TENSILE WIRE FENCE

In areas experiencing persistent and severe deer damage, the same fence discussed above can be electrified using AC current (See FIGURE C, page 21). DC battery or solar/battery chargers are used where electricity is unavailable. The modern-type fence chargers currently available have a strong shocking power (up to 8000 volts) but low impedance. Thus, they are extremely effective but safer than older-type chargers because they don’t cause a burning effect. Construction is similar although insulators are used in lieu of staples, fewer wires are needed, and wires are alternating negative and positively charged (with a positive wire on the bottom and top). This is important in that the animal will always be in contact with the ground-wire even when standing in deep snow or in a mid-air jump. The fence functions as more of a psychological barrier than a physical one after animals have experienced the shock, thus even a low fence (+ or - 24”) can be effective in keeping the majority of animals out. The fence can be baited by tying aluminum foil flags covered with peanut butter on to the charged wire to aid in training animals to the fence.
MODIFIED ELECTRIC HIGH-TENSILE WIRE FENCE

A nice feature of the above design is that it can be used with an existing fence in a variety of applications, and can be utilized even on a small scale for the average garden grower. The electric high-tensile fence discussed above can actually be constructed on top of an existing fence (such as a square or v-mesh wire or wood fence) using extensions, such as stand-off insulators for a single wire, or a 2" x 4" board attached to the existing post with lag screws for multiple wires. High-tensile fencing manufacturers do not recommend combining electric fencing with barbed wire however as severe injury and fatalities to animals have resulted. With the multiple wire design, positive wires should be alternated with grounded wires.

An advantage to this type of fencing over the completely electrified high-tensile fence is that this one will not often ground out due to vegetation growth and thus will require less maintenance. Much of this equipment can also easily be erected on a temporary basis during the height of the growing season if the problem is only a seasonal one. A disadvantage is that it will probably not be 100% effective in keeping out all animals. ‘Polywire,’ which is basically an electrified plastic tape can also be used for higher visibility (a bright orange color) and doesn’t require tensioning.

SQUARE-MESH WOVEN-WIRE GAME FENCE

Square-mesh fence has been used primarily to control damage to orchards and nurseries (See FIGURE D, page 22). The fence is constructed similar to the high-tensile design, is considerably lighter than the V-mesh wire fence and is easier to construct. The fence is constructed using 10 ft. posts set 4 ft. in the ground and spaced 20 ft. apart. Wire fencing is available in 6-ft. and 8-ft. heights. This fence design has been proven to repel deer and elk. The fence is also effective against coyotes, pigs and rabbits when the wire is buried one foot in the ground.

V-MESH

The V-mesh wire fences have been used primarily to control damage to haystacks. The V-mesh wire fence is constructed using 10 ft. wood posts set 4 ft. in the ground at 12 ft. intervals. The V-mesh wire comes in heights of 42 in. to 96 in. with the 72 in. being the most commonly used to control deer. This fence is difficult to build because of the heavy wire.

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CONSTRUCTION

All fence designs utilize double braced corner posts set in concrete or ‘tamped’ in gravel, with line-posts in between corners and fence-stays in between line-posts to maintain wire position. A construction manual or the fence manufacturer should be consulted on how to build particular fence types. Several are listed on page 25. Cost per foot and fence lengths may vary depending on the manufacturer (See “PLANNING,” page 23). Manufacturers and other pertinent regulatory agencies should be contacted when using any treated wood products, particularly around groundwater. Except where noted, longer posts and taller wire can be used with each design with minor modifications to control elk effectively as well.
REFERENCES

FENCE CONSTRUCTION:
Fences For Controlling Deer Damage. California Agricultural Experiment Station
Extension Service Circular 514.
How to Design and Build Gates and Fences. Ortho Books.
How to Build Fences and Gates. Sunset Books.
How to Build Fences With High-Tensile Fence Wire. U.S. Steel Cat. T-111575. U.S.
Steel, Pittsburgh, Pa. 75pp.
Control Big Game Damage in Northwest Colorado. E.A. Byrne, Biologist, Colorado
Damage Control Work Shop, Fort Collins, Colorado.
Wildlife Pest Control Around Gardens and Homes. Salmon, T.P. and R.E. Lickliter,
1984. Division of Agriculture and Natural Resources, University of California,
Cooperative Extension, Publication #21385.
Fence diagrams provided by Minnesota Department of Natural Resources.

PLANTS:
A New List of Deer Resistant Plants for the Garden. Pacific Horticulture, November
1990.
Deer-Resistant Plants for Ornamental Use. University of California Cooperative
FIGURE B
BRACE SYSTEMS

DOUBLE HORIZONTAL BRACE ASSEMBLY

SINGLE HORIZONTAL BRACE ASSEMBLY

DIAGONAL BRACE ASSEMBLY
PLANNING

* Check local laws and zoning regulations regarding fences and electricity, especially in urban areas.

* Locate hazards and obstacles such as power lines, hills, dips and water.

* Use as few corners as possible.

* Prepare a sketch of the fence.

* Prepare a list of materials.

* A well-prepared fence line saves time and materials.

* Include space for easy fence construction and vehicle access.

* Build the fence at least five feet from old fence rows, brush lines or woods.

* A charger must be ready before construction begins.