

# Landscaping and Utilities<sup>1</sup>: Problems, Prevention, and Plant Selection

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Trees and shrubs properly placed and maintained in the landscape are a valuable resource for homes and communities. However, without careful planning and plant selection prior to planting, trees and shrubs can become a nuisance and a dangerous and costly problem for homeowners and businesses.

Utility companies spend millions of dollars annually maintaining or removing hazardous or potentially hazardous trees and shrubs. Why? Because trees touching power lines conduct electricity, which may cause annoying power interruptions and increase the risk of shock or electrocution to people touching the plants. Also, broken branches, tops, and wind-blown trees frequently damage utility lines, causing hazardous situations and service loss.

The problems of growing woody plants and other coarse-rooted perennials near utilities are not restricted to overhead lines or cables. Roots can damage sewer systems and other underground utility lines. Trees or shrubs planted too close to meters, transformers, and other utility units may prevent people from seeing them, increasing the risk of human injury and damage to property and utilities. They can also create access problems for utility workers who need to read or service equipment, especially thorny species such as **barberries** (*Berberis* sp.), **hollies** (*Ilex* sp.), **firethorns** (*Pyracantha* sp.), or **roses** (*Rosa* sp.). By carefully planning and selecting proper plant materials, you can reduce the risks and costs associated with these problems, and prevent the need for unsightly but necessary pruning.

## Planting Near Surface and Overhead Utilities

The key to any successful landscape plan is to match the plant to the site. Homeowners and landscapers often mistakenly plant in a particular area before they have determined if the plant is suitable for that location. (For general guidelines on planning and designing a private landscape, refer to CIS 168, *Landscape Your Home Grounds*.) Two simple rules for planting near overhead utility lines are:

1. Plant trees and shrubs away from utilities, and
2. If planting trees near overhead lines, place taller trees away from overhead lines and use shorter, slower growing trees for closer planting.

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<sup>1</sup>The terms *utilities* and *utility* refer to the equipment used in the monitoring or transmission of gas, electricity, water, sewage, cable television, and telecommunications.

Keep in mind, that even though shorter trees or shrubs planted under power lines do not directly interfere with power lines, they can create problems for maintenance crews by interfering with equipment movement and placement. Figure 1 shows the minimum distances prescribed for planting trees and shrubs near overhead lines based upon the mature heights of the plants. See pages 4 and 5 for a list of trees and shrubs recommended for Idaho.

Before planting near utilities, first consider what you want to do with the overall site, and then make specific decisions about the areas close to utilities. It may be more effective, and practical, to plant a dense cluster of shrubs near a window or in the line of a particular view to screen a utility, rather than planting trees close to utilities.

*Specimen* plants (plants that attract immediate attention) or mass plantings can be used to: (1) draw attention away from utilities; or (2) draw attention to, or block potential hazards, such as guy wires or underground transformers. Figure 2 illustrates how a mulched bed of low shrubs properly planted around an

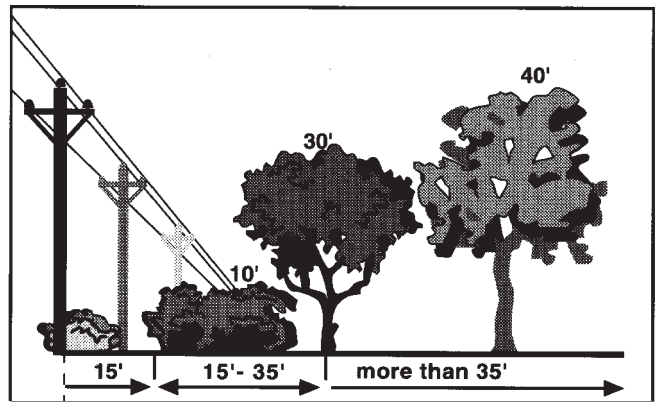


Fig. 1. Recommended spacing for trees and shrubs planted near utility lines.

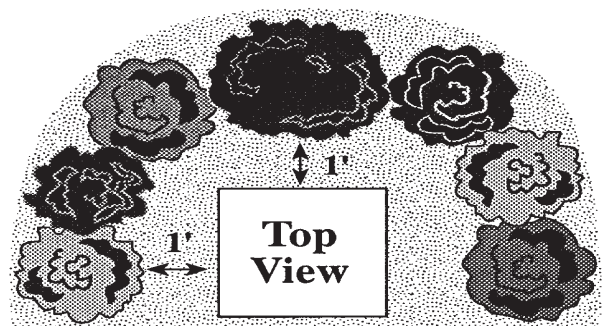
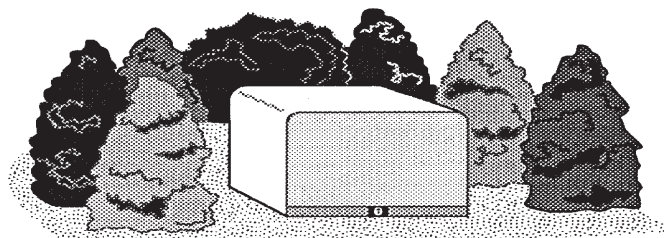


Fig. 2. Landscaping guidelines for underground transformers.

underground transformer can prevent people from injuring themselves or damaging property. Prune plants back to at least 12 inches from transformer boxes, and do not place any plants in front of the padlocked side of the units.

When planting trees or shrubs near overhead utility lines, consider these qualities:

- √ Slow growing (no more than 1 to 2 feet per year) with strong branching patterns to prevent wind and snow damage,
- √ Adapted to the specific site planted, including cold tolerant (generally speaking, Idaho covers four zones, 2-6. To be safe consider using plant material rated at one temperature zone lower than the specific USDA hardiness zone shown for your area; see page 6 for your specific location), and drought tolerant for areas where water is scarce,
- √ Deep rooted, and
- √ Easy to maintain once established.

Species not recommended for planting near overhead utility lines include: **black locust** (*Robinia pseudoacacia*), **boxelder maple** (*Acer negundo*), **cottonwoods** or **poplars** (*Populus* sp.), **London planetree** (*Platanus x acerifolia*), **Russian olive** (*Eleagnus angustifolia*), **silver maple** (*Acer saccharinum*), tall **conifers** (*Abies* sp., *Picea* sp., *Pinus* sp., *Pseudotsuga menziesii*), **sycamore** (*Platanus occidentalis*), **willow** (*Salix* sp.), and **vines** that may cover or grow into transformers or along utility lines. You should also be aware of sewer lines and septic system locations when planting.

## Planting Near Underground Utilities

Trees or shrubs planted too close to septic systems and sewer lines can create major damage. Roots can penetrate cracked tile or loose pipe junctions, and are the item most frequently found in drain and sewer pipes. In addition to clogging sewer lines and septic systems, the expanding tree roots can lift or crush sewer lines or cables, creating additional problems related to service loss, environmental hazards, and costly repairs.

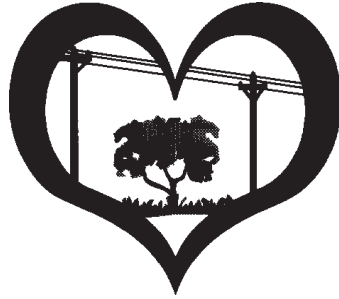
The safest practice is to plant trees and shrubs as far away from underground utilities as possible; however, if you must plant in these areas, avoid species such as **willows**, **poplars**, and **cottonwoods** with dense, fibrous roots.

## Local and State Ordinances

In addition to the general guidelines for planting near utilities, most communities have specific guidelines regarding tree and shrub placement along curbs, sidewalks, and right of ways, and in some cases, the species or types of trees that can be planted in these locations. As you plan your landscape, consult local and state authorities for specific regulations about what types of trees can be planted along streets or in other public areas.

## Recommended Species for Idaho<sup>2</sup>

### Small to medium shrubs (up to 10 feet tall)



*Cornus alba siberica* (Red-veined dogwood). Zone: 2.

*Cornus sericea* (Redosier dogwood). Zone: 2.

*Cotoneaster apiculatus* (Cranberry cotoneaster). Zone: 5.

*Euonymus alata* 'Compactus' (Burning bush). Zone: 5.

*Juniperus chinensis* (Chinese juniper). Dwarf cultivars include 'Armstrongii,' 'Mint Julep,' and 'Old Gold.' Zone: 4.

*Juniperus horizontalis* (Creeping juniper). Cultivars include 'Youngstown,' 'Bar Harbor,' and 'Blue Chip.' Zones: 4.

*Juniperus squamata* 'Blue Star' ('Blue Star' singleseed juniper). Zone: 5.

*Mahonia aquifolium* (Oregon grapeholly). Zone: 5.

*Mahonia aquifolium* 'Compactum' (Compact Oregon grape). Zone: 6.

*Pachystima myrsinites* (Mountain lover). Zone: 5.

*Paxistima canbyii* (Canby paxistima). Zone: 4.

*Philadelphus lewisii* (Mockorange). Zone: 5.

(Dwarf)*Picea abies* (Dwarf Norway spruce). Cultivars include 'Nidiformis' (Bird's nest spruce) and 'Procumbens.' Zone: 2.

*Pinus mugo* var. *mugo* (Mugo pine). Zone: 2.

*Potentilla fruticosa* (Shrubby cinquefoil). Zone: 2.

*Prunus besseyi* (Western sandcherry). Zone: 4.

*Prunus tenella* (Dwarf Russian almond). Zone: 2.

*Rhododendron* spp. (Rhododendrons and azaleas). Zone: 2.

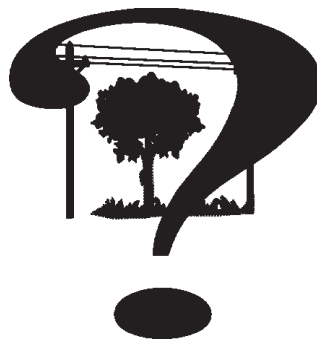
*Spirea x bumalda* (Bumald spirea). Zone: 4.

*Syringa villosa* (Late lilac). Zone: 2.

*Symphoricarpus albus* (Snowberry). Zone: 4.

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### Large shrubs to small trees (10 to 30 feet tall)



*Acer circinatum* (Vine maple). Zone: 4.

*Amelanchier alnifolia* (Saskatoon serviceberry). Zone: 4.

*Amelanchier canadensis* (Shadblow serviceberry). Zone: 4.

*Aronia melanocarpa* var. *elata* (Black chokeberry). Zone: 4.

*Aronia prunifolia* (Purple-fruited chokeberry). Zone: 4.

*Cercis canadensis* (Eastern redbud). Zone: 5.

<sup>2</sup>Hardiness and heights may vary between different cultivars within a species.

*Cornus alternifolia* (Pagoda dogwood).  
Zone: 4.

*Cornus mas* (Cornelian cherry). Zone:  
5.

*Corylus maxima purpurea* (Purple giant  
filbert). Zone: 5.

*Cotinus coggyria* (Smoketree). Zone: 6.

*Crataegus laevigata* 'Crimson Cloud'  
( 'Crimson Cloud' English hawthorn).  
Zone: 5.

*Crataegus* x *lavalleyi* (Lavalle haw-  
thorn). Zone: 5.

*Laburnum* x *watereri* (Golden chain  
tree). Zone: 2.

*Magnolia soulangiana* (Saucer magno-  
lia). Zone: 5.

*Malus* spp. (Ornamental crabapples).  
Zone: 3.

*Morus alba* 'Pendula' (White weeping  
mulberry). Zone: 5.

*Photinia villosa* (Oriental photinia).  
Zone: 5.

*Pinus densiflora* 'Umbraculifera'  
(Tanyosho pine). Zone: 4.

*Sorbus americana* (American ash).  
Zone: 2.

*Syringa reticulata* (Japanese tree lilac).  
Zone: 4.

*Syringa vulgaris* (Common lilac).  
Zone: 4.

*Taxus* x *media* 'Hicksii' (Hick's yew).  
Zone: 5.

*Viburnum dentatum* (Arrowwood  
viburnum). Zone: 2.

*Viburnum trilobum* (Cranberry bush  
viburnum). Zone: 2.

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### Medium to tall tree (more than 30 feet tall)



*Acer campestre* (European field  
maple). Zone: 6.

*Acer rubrum* 'Atropurpureum' (Red  
maple). Zone: 4.

*Acer saccharum* (Sugar maple).  
Zone: 4.

*Aralia elata* (Japanese angelica-tree).  
Zone: 4.

*Carpinus betulus* 'Columnaris' (Co-  
lumnar hornbeam) Zone: 5.

*Cladrastis lutea* (American yellow-  
wood). Zone: 5.

*Fraxinus americana* 'Skyline' (Skyline  
ash). Zone: 4.

*Ostrya virginiana* (American  
hophornbeam). Zone: 4.

*Parrotia persica* (Persian parrotia).  
Zone: 5.

*Pinus aristata* (Bristlecone pine).  
Zones: 4.

*Pinus cembra* (Swiss stone pine).  
Zone: 5.

*Pinus flexilis* (Limber pine). Zone: 5.

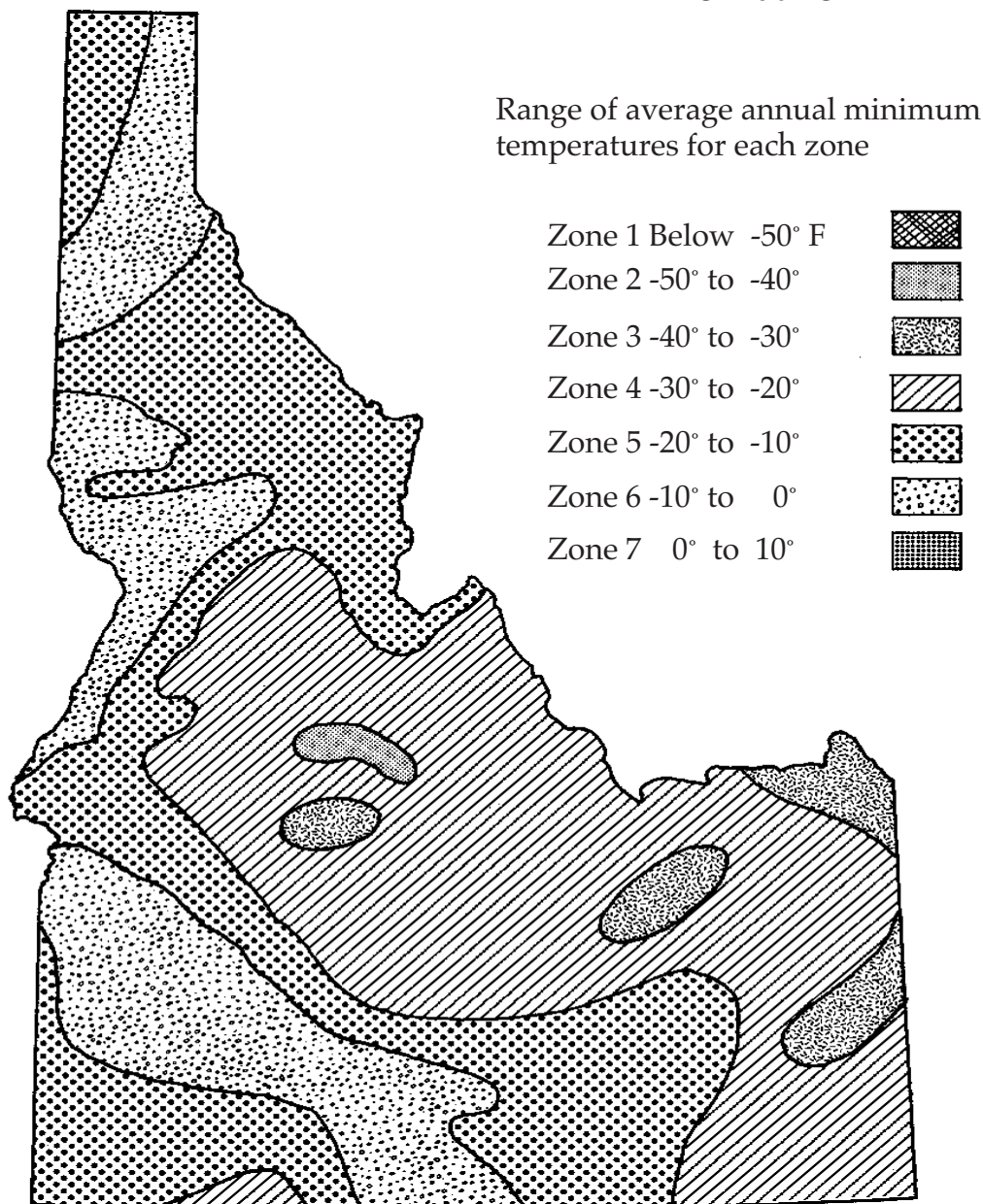
*Pinus parviflora* (Japanese white pine).  
Zone: 5.

*Quercus coccinea* (Scarlet oak).  
Zone: 5.

*Quercus robur* 'Fastigiata' (Fastigate  
English oak). Zone: 5.



## USDA Plant Hardiness Zones for Idaho



Most of the zones listed above were taken from Dirr's "Manual of Woody Landscape Plants." Hardiness zones had to be converted from Arnold Arboretum hardiness zones to USDA hardiness zones. Therefore, the actual hardiness range may be  $\pm 5^\circ$  F of the temperature range listed for each zone.

Use hardiness zone maps as the minimum standard for selecting plant materials for your area. Consult local or regional weather services and publications for specific weather information, including high and low temperature extremes for your area. (See EXT 744, *Specialty Farming in Idaho: Selecting a Site* for specific weather information about Idaho counties).

## Further Readings

For more detailed descriptions of plant materials and their specific habitat requirements, or for more information about planting near utilities, see the following publications:

- Dirr, M. A. 1990. *Manual of Woody Landscape Plants*, 4th ed. Champaign, IL: Stipes Publishing Company.
- Fitzgerald, T., D. Notske, M. Stone, S. McCrea, and A. Gates. 1991. *Landscape Plants for the Northwest*. EB1579. Pullman, WA: Washington State University Cooperative Extension.
- Higginbotham, J. S., Ed. 1993. *Pipe Dreams Take Root*. *American Nurseryman* 178(2):19. Chicago, IL: American Nurseryman Publishing Company.
- Hogan, E. F., Ed. 1990. *Sunset Western Garden Book*. Menlo Park, CA: Sunset Publishing Company.
- Living with Trees. 1993. B. C. Hydro, Environmental Resources, Corporate and Environmental Affairs, c/o 970 Burrard Street, Vancouver, B. C. V6Z.
- Plant Materials for Landscaping: A List of Plants for the Pacific Northwest. 1981. PNW 185. Oregon State University, Corvallis, OR: A Pacific Northwest Cooperative Extension Publication.
- The Book of Trees: Tree Selection Guide. The Washington Water Power Company. East 1411 Mission, Spokane, WA 99202.
- Tree Book. Puget Sound Power and Light Company. Attention: Corporate Forester, P. O. Box 97304, Bellevue, WA 98009-9734.
- Tree Power. American Public Power Association. 2301 M Street NW, Washington, D. C. 20037-1484.
- Tree Selection Guide for Street Tree Planting. 1991. Lewiston Parks and Recreation Urban Forestry Program. P. O. Box 617, Lewiston, ID 83501.
- Utility and Arborist Association and the International Society of Arboriculture. 1992. *Avoiding Tree and Utility Conflicts*. ISA, P. O. Box GG, Savoy, IL 61874-9902.
- Wyman, D. 1977. *Wyman's Gardening Encyclopedia*. New York, NY: Macmillan Publishing Co., Inc.
- Yunker, G. L., C. W. Johnson, F. A. Baker, W. S. Johnson. 1990. *Urban and Community Forestry: A Guide for the Interior Western U.S.* Ogden, UT: USDA Forest Service, Intermountain Region.

To order the following or other University of Idaho publications, contact the University of Idaho Extension agent in your county or write: Ag Publications, University of Idaho, Moscow, Idaho, 83844-2240, or call (208) 885-7982.

CIS 168 Landscape Your Home Grounds (35¢).

EXT 657 Native Plants from Northern Idaho (\$1).

EXT 744 Specialty Farming In Idaho:  
Selecting a Site (\$1).

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### **Acknowledgements**

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Discrete Location Problems Benchmarks Library. Simple Plant Location Problem. Home Benchmarks Library. Optimization Algorithms. Benchmarks. Demo software. There are different titles for the simple plant location problem: the problem of a nonrecoverable tools optimal system [1]; the standartization and unification problem [2]; the optimal parameter problem for the uniform technical system [3]; the location of bank accounts problem [4]Â Stated problem is the generalization of the well-known set covering problem and, therefore, it is NP-hard problem in the strongly sense. Exact algorithms, approximation algorithms with constant performance guarantee, Lagrangian heuristics, randomized iteration algorithms of local search were developed for solving simplest location problem. Sustainable landscaping is a modern type of gardening or landscaping that takes the environmental issue of sustainability into account. According to Loehrlein in 2009 this includes design, construction and management of residential and commercial gardens. A sustainable garden is designed to be both attractive and in balance with the local climate and environment and it should require minimal resource inputs. Thus, the design must be âœfunctional, cost-efficient, visually pleasing, environmentally 1994. Landscaping and Utilities: Problems, Prevention and Plant Selection . CIS 991 University of Idaho AES, Moscow. 5. Bauer, M. E. 1996. Selecting and Maintaining Water Efficient Landscape Plants . Oregon State University Extension Service, Deschutes County, OR. 6. Curchillo et.al. Tree Selection Guide , Lewiston Parks & Recreation Urban Forestry Program, Lewiston, ID. 7. Ries et. al. City of Hailey Tree Selection & Planting Guide. 8. Brenzel et.al. 1995. Sunset Western Garden Book , Sunset Publishing Corporation, Menlo Park, CA.