

Trees and Shrubs for Overhead Utility Easements

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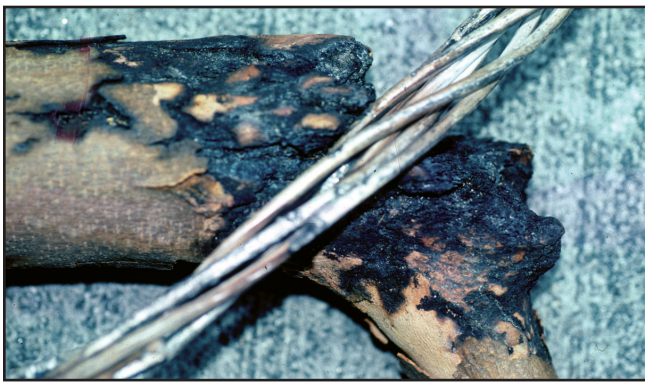
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Trees are valuable assets in commercial, private, and public landscapes. Trees add aesthetic beauty, modify and enhance the environment, serve architectural and engineering functions, and increase property and community economic values. These same trees that enhance landscapes, however, are a major challenge for utility companies. Most people have grown accustomed to reliable, uninterrupted electric, telephone and

cable service in their homes and offices. Unfortunately, trees are one of the major causes of power outages in areas of overhead utility lines due to direct tree contact with lines, or to trees or tree limbs falling on the lines.

When trees contact live wires they become conductors of electricity, causing power outages or creating dangerous situations for anyone coming in contact with the trees. Utility companies spend over \$1.5 billion annually on labor and materials for tree pruning and removal. This maintenance work is necessary to protect the public and utility company employees who service the lines, and to insure safe, reliable electrical service. While we don't want to risk losing this service, many of us dislike seeing trees removed or compromised in order to provide the service. The practice of planting tree species with potentially inappropriate mature heights, or erecting utility lines where tall trees already exist, greatly increases these problems. In addition, utility companies incur public relations problems and costs due to criticism of tree management within easements.



Tree limb burned by contact with utility wires.



Misshapen tree canopies due to necessary line clearance pruning.

Conflict resolution options

Line clearance methods for existing utility line/street tree conflicts, such as natural, lateral, and directional pruning, have been developed to minimize the impact of pruning on tree health. Unfortunately, people often find this necessary pruning to be aesthetically unacceptable. Because of the inherent danger of electric lines, any pruning needed within easement areas should only be carried out by arborists trained in line clearance pruning, never by homeowners.



Directional pruning for line clearance.



Trained arborists removing limbs in utility easements.

Additional options for dealing with utility line/street tree conflicts include the use of tree growth regulators, tree height control by pollarding (yearly pruning back to one trunk or branch area), and initiation of tree pruning far in advance of tree-line interception. Each of these options tries to prevent future conflict situations, but is still costly maintenance. Whole tree removal eliminates the conflict but negatively impacts the environment and community.

The best approach is to prevent street tree/utility line conflicts from arising in the first place. Where practical, new utility lines can be constructed to avoid potential conflicts with trees either by installing lines underground or routing lines to avoid existing trees.



Large sycamore trees pollarded to keep them from infringing on utility lines.

Selection of appropriately sized trees prior to planting is critical to the trees' successful co-existence with overhead utility lines. This option is available to anyone involved with landscape design and installation - city planners, landscape architects, designers and contractors, arborists, and private homeowners. Proper selection and planting of trees near overhead utility lines can improve the appearance of the landscape, prevent safety hazards, improve electric service reliability, and reduce line clearance expenses for utility companies and their customers.



Crape myrtle, a large shrub or small tree that can be used under overhead lines.



Tall, upright trees can be planted along, but never under, overhead lines.

Tree selection and planting

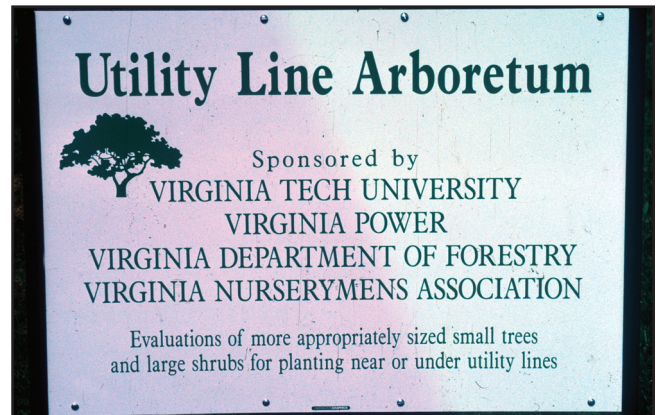
Before planting new trees, look overhead and all around the intended site. Note how far the tree planting site is from overhead utility lines. For plant selection, determine whether the proposed planting site falls into a low, medium or tall tree height zone (Figure 1.). The **low height zone** extends 15 feet on either side of overhead wires. Plant large shrubs and small trees with mature heights of 20 feet or less within this area. To account for the width of taller trees, the **medium height zone** begins at least 15 feet from all utility lines and may include the area that frames a building or residence. Select trees that grow 40 feet or less for this zone. The **tall height zone** begins at least 35 feet from buildings and 65 feet from utility lines. Tall trees need additional space to permit adequate root development and to minimize structural storm damage. Select trees that grow taller than 40 feet for this area. Use tall trees in wooded lots, parks or other open areas where their height and spread can be appreciated without becoming a liability.

When selecting a particular tree species, consult a reference that will provide the tree's mature height and spread. When selecting urban trees, avoid those that require high maintenance (frequent pruning, control of major pest problems, etc.) or drop messy fruits, leaf litter and twigs. Look for trees that can tolerate generally adverse urban conditions (limited soil volume and moisture, compacted soil, air pollution, etc.), and that have a slow to moderate (never fast) growth rate. Always follow proper tree and shrub planting guidelines (see VCE Publication 430-295) and call MISS UTILITY (check your local phone directory) before you dig any planting hole.

At the Hampton Roads Agricultural Research and Extension Center in Virginia Beach, a Utility Line Arboretum showcases small trees and large shrubs for

use in or near utility easements. Selection and availability of alternative trees and shrubs will improve with greater industry and public awareness of utility line issues.

When selecting "utility line" trees and shrubs, plant several different genera and species to avoid pest (insect and disease) and physiological (weather, chemical, etc.) problems that can easily kill off plantings of single species or cultivars (monocultures).



The utility Line Arboretum at Virginia Tech's Hampton Roads Agricultural Research and Extension Center.

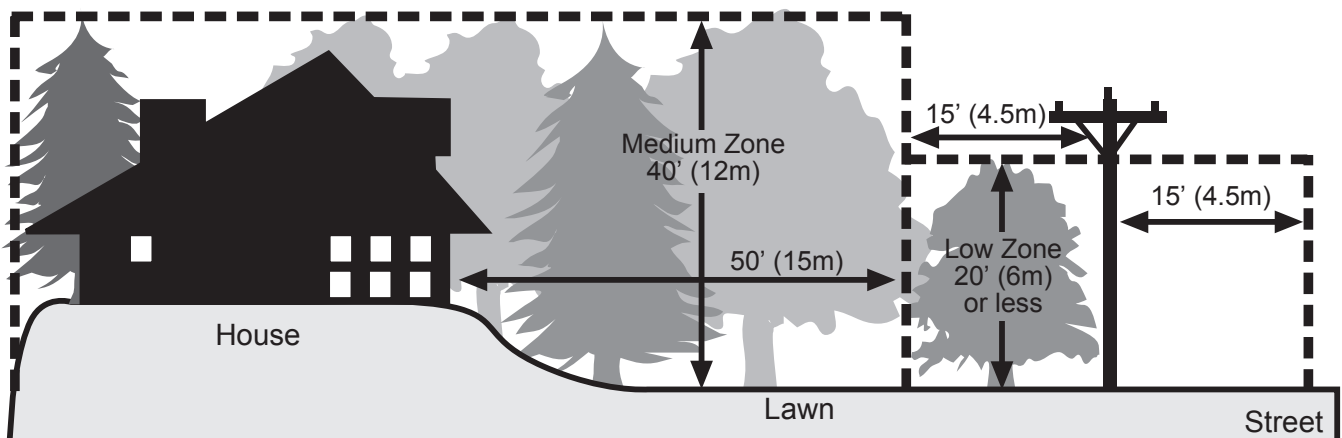


Figure 1.

Common name	Latin name	Cold hardiness/ heat tolerance zones	Ave. mature height
Low Height Zone - Under Utility Lines			
Trees that generally do not exceed 20 feet in mature height, or that may need infrequent crown height reduction.			
Amur maple	<i>Acer ginnala</i>	2-8/7-1	15'-18'
Globe Norway maple	<i>Acer platanoides</i> 'Globosum'	4-8/8-3	15'-18'
Serviceberries	<i>Amelanchier arborea</i> , <i>A. canadensis</i>	4-9/9-4	15'-30'
Chinese fringetree	<i>Chionanthus retusus</i>	6-8/8-5	15'-25'
White fringetree	<i>Chionanthus virginicus</i>	5-9/9-5	10'-20'
Pagoda dogwood	<i>Cornus alternifolia</i>	4-8/8-1	15-25'
Cornelian cherry	<i>Cornus mas</i> 'Spring Glow'	5-8/8-3	20-25'
Leprechaun ash	<i>Fraxinus pennsylvanica</i> 'Johnson'	4-9/9-1	15'-18'
Little Gem magnolia*	<i>Magnolia grandiflora</i> 'Little Gem'	7-9/9-3	10'-20'
Saucer magnolia	<i>Magnolia x soulangiana</i>	6-9/9-6	15'-25'
Star magnolia	<i>Magnolia stellata</i>	5-9/9-5	6'-20'
Flowering crabapple	<i>Malus</i> spp.	4-8/8-1	10'-30'
Cherry plum	<i>Prunus cerasifera</i> 'Thundercloud'	5-9/9-4	15'-20'
Siebold viburnum	<i>Viburnum sieboldii</i>	4-8/8-5	15'-20'
Large shrubs that can be pruned into tree form for use under overhead utility lines.			
Althea/rose of Sharon	<i>Hibiscus syriacus</i>	5-9/9-1	8'-12'
Crape myrtle*	<i>Lagerstroemia indica</i>	7-9/9-7/6	10'-25'
Doublefile viburnum	<i>Viburnum plicatum</i> var. <i>tomentosum</i>	6-8/8-6	6'-15'
Blackhaw viburnum	<i>Viburnum prunifolium</i>	3-9/9-1	12'-20'
Chastetree	<i>Vitex agnus-castus</i>	6-9/9-1	8'-15'
Medium Height Zone - Near Utility Lines			
Trees that generally exceed 20' in mature height; if used under easement will require more frequent pruning if planted in good growing location.			
Trident maple	<i>Acer buergeranum</i>	5-9/9-3	20'-25'
Hedge maple	<i>Acer campestre</i>	5-8/8-4	25'-35'
American hornbeam	<i>Carpinus caroliniana</i>	3-9/9-1	20'-35'
White redbud	<i>Cercis canadensis</i> 'Texas White'	6-9/9-6	20'-30'
Kousa dogwood	<i>Cornus kousa</i>	5-8/8-3	20'-30'
Stellar dogwood	<i>Cornus x rutgerinensis</i>	5-8/8-3	20'-30'
Thornless cockspur hawthorne	<i>Crataegus crus-galli</i> var. <i>inermis</i>	4-7/7-1	20'-30'
Washington hawthorne	<i>Crataegus phaenopyrum</i>	4-8/8-1	25'-30'
Carolina silverbell	<i>Halesia diptera</i>	5-8/8-4	30-40'
Goldenraintree	<i>Koelreuteria paniculata</i>	6-9/9-6	25'-35'
Galaxy magnolia	<i>Magnolia x 'Galaxy'</i>	6-9/9-6	20'-30'
Merrill magnolia	<i>Magnolia x loebneri</i> 'Merrill'	5-9/9-5	25-30'
Sourwood	<i>Oxydendron arboreum</i>	5-9/9-4	20'-40'
Persian parrotia	<i>Parrotia persica</i>	4-7/7-1	20'-40'
Chinese pistache	<i>Pistacia chinensis</i>	6-9/9-6	30-35'
Flowering apricot	<i>Prunus mume</i>	6-8/8-6	20'-25'
Okame cherry	<i>Prunus x 'Okame'</i>	5-8/8-4	20-25'
Yoshino cherry	<i>Prunus x yedoensis</i>	6-8/8-6	20'-40'
Flameleaf sumac	<i>Rhus copallina</i>	4-9/9-3	20'-30'
Japanese stewartia	<i>Stewartia pseudocamellia</i>	5-8/8-5	20'-40'
Japanese snowbell	<i>Styrax japonicus</i> (esp. 'Pink Chimes')	6-8/8-6	20'-30'
Fragrant snowbell	<i>Styrax obassia</i>	6-8/8-6	20'-30'
Japanese tree lilac	<i>Syringa reticulata</i>	4-7/7-1	20'-30'
Tall trees that can be used near (but not under) utility lines due to their more upright or narrow crowns.			
Norway maple	<i>Acer platanoides</i> 'Columnare', 'Crimson Sentry', 'Easy Street', 'Olmstead'	3-7, 7-1	25'-45'
Red maple	<i>Acer rubrum</i> 'Armstrong', 'Bowhall'	3-9/9-1	40'-50'
Sugar maple	<i>Acer saccharum</i> 'Apollo', 'Newton Sentry'	4-8/8-3	30'-50'
European hornbeam	<i>Carpinus betulus</i> 'Columnaris', 'Fastigiata'	4-8/8-1	30'-50'
Ginkgo	<i>Ginkgo biloba</i> 'Fairmount', 'Fastigiata', 'Princeton Sentry'	5-9, 9-2	40'-60'
Southern magnolia*	<i>Magnolia grandiflora</i> 'Alta', 'Hasse'	7-9, 9-3	40'-50'
Callery pear	<i>Pyrus calleryana</i> 'Capital', 'Cleveland Select', 'Whitehouse'	5-8/8-2	30'-40'
English oak	<i>Quercus robur</i> 'Fastigiata', 'Skyrocket'	4-8/8-4	40'-50'

*Plants that, due to lack of cold hardiness, are not suitable for planting in all parts of Virginia (check your hardiness zone).

Acknowledgments

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