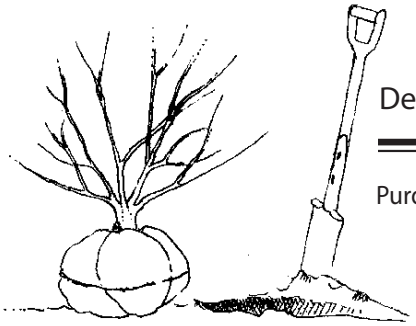
Appendix 11



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Landscape Tree Appraisal

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Appraising the Monetary Value of Landscape Plants

Landscape plants serve functional and esthetic roles in rural, urban commercial, or residential landscapes. Such plants have market value much like real estate, but that value is often difficult to determine. In the case of loss of landscape plants, however, it may be necessary to establish a monetary value to validate an insurance claim or to justify a loss to the Internal Revenue Service.

Appraisal of landscape plants is not a precise process. Often, the opinion of an expert plantsman or consulting arborist is required, especially in the case of claims, which are decided through litigation. However, homeowners can get some idea of the value of their landscape plants by following the procedures outlined in this bulletin. In some cases, a value determined by the homeowner may be sufficient to settle a claim, or to satisfy the IRS.

Three different methods are used by professionals to arrive at a value for landscape plants. Select the simplest method, which is appropriate to the size and number of landscape plants for which a value is required.

Decrease in Assessed Value of Real Estate

When many plants are affected on a piece of property, or when a dominant landscape element is lost, then the change in assessed valuation may be the best indicator of value. Ask a realtor or land appraiser to assess the property with and without the plant or plants affected. A good, recent photograph of the landscape is valuable in establishing the property status before the loss.

Replacement Cost

Small trees or shrubs that are easily transplanted at their full size can be appraised by determining the cost of replacement. A local nurseryman can quote replacement costs, which should include removal of the dead or damaged plant, installation, post-transplanting care, and a survival guarantee. If the plant was in poor condition prior to the loss, the appraised value may be less than the full cost of replacement.

Formula Computation

The formula method is in widespread use for large, individual trees, which exceed the size that is usually transplanted. It is a hybrid of the replacement cost method and a process of extending that cost to larger plants. The guidelines for this method are distributed by the Council of Tree & Landscape Appraisers and are accepted by professionals in the landscape industry and the real estate and legal disciplines.

The formula is as follows:
Tree Value = Base Value × Cross Section Area × Species Class × Condition Class × Location Class

Base Value

Base Value is the dollar amount assigned to one cross-section unit (square inch or square centimeter) of a tree's trunk cross-section area. It is based on the cost of the largest available replacement plant of similar species. To compute the base value, find the cost (usually the installed price) of a replacement-size tree from a local nursery or landscape company. Then, divide that amount by the trunk cross-sectional area of the replacement tree. That amount is the base value for that cross-sectional unit. For example, if a 2 inch trunk diameter replacement tree will cost $150 installed, then

divide $150 by 3.1 sq.in. (from Table 1) to determine that one square inch of cross-sectional area is valued at $48.40 (rounded to the nearest dime).

Table 1. Diameter and Cross Section Area of Tree Trunks.

Inches		Centimeters	
Trunk Diameter	Cross-Section Area	Trunk Diameter	Cross-Section Area
2	3.1	5	19.6
4	12.6	10	78.5
6	20.3	15	176.7
8	50.3	20	314.2
10	78.5	25	490.9
12	113.1	30	706.9
14	153.9	35	962.1
16	201.1	40	1256.6
18	254.5	45	1590.4
20	314.2	50	1963.5
22	380.1	55	2375.8
24	452.4	60	2827.4
26	530.9	65	3318.3
28	615.8	70	3848.5
30	706.9	75	4417.9
32	804.3	80	5026.6
34	907.9	85	5674.5
36	1017.9	90	6361.7
38	1134.1	95	7088.2
40	1256.6	100	7854.0

Cross-Section Area

Cross-Section Area is used to express tree size. It is the cross-sectional area of the tree trunk measured about one foot (30 cm) above ground level for trees with trunk size up to 12 inches (30 cm) in diameter, or at about 4 1/2 feet (140 cm) above ground level for trees with greater than 12 inch (30 cm) trunk diameter. Cross-section area can be calculated from trunk diameter by using the formula diameter^2 x 0.7854. It can be computed in either square inches or square centimeters. Cross-section areas for trunk diameters ranging from 2 inches to 40 inches and 5 cm to 100 cm are listed in Table 1.

Abnormal trunk structures such as low-branch crotches or forked trunks, burls, or wound scars at the prescribed location for diameter measurement require that the measurement be taken at a different location. Typically, such measurements are made 6 to 12 inches (15 to 30 cm) below the abnormality.

A multi-stemmed tree is measured as separate trunks and then a combined size value is computed. Compute the cross-section areas for all but the largest stem, add them together, and multiply that total by 0.50. Add that value to the cross-section area of the largest stem. The result is a multi-stemmed cross section area value.

Species Class

Species Class is an assigned value based on all the landscape merits of a landscape tree species and its accompanying potential for problems. Criteria used in determining species class include form, color, growth habit, flowering and fruiting characteristics, structural strength, longevity, insect and disease resistance or susceptibility, and maintenance requirements. Each tree species can be assigned any value from 1% to 100% but for practical simplicity, species are usually placed in one of five percentage classes (100, 80, 60, 40, 20). Table 2 is a listing of species class values for many common landscape trees of Indiana. Express the class as a decimal for use in the formula. Thus, 80 becomes 0.80, 100 becomes 1.00, etc.

Condition Class

Condition Class is a factor indicating the health, vigor and life expectancy of a tree, as well as its quality of form relative to a "perfect specimen" of that species. This value can be any percentage from 1% to 100%, but is commonly expressed as one of five percentage categories (100, 80, 60 to 40, 20, 0). The rating is based on such defects as wounds, decay, storm damage, insect or disease damage, and poor form. Very few trees are perfect specimens. However, it is possible to improve condition class if proper cultural treatments are given.

The accuracy of the value assigned for tree condition is dependent on the expertise of the appraiser. It is this judgement which may be most difficult for the nonprofessional to make. Damage to the trunk, for example, may significantly reduce a tree's life expectancy, or the damage may be superficial; and while unsightly, it may not indicate a poorer condition and shortened life span. Professional consultation may be necessary to determine this factor. Table 3 can serve as a guide in assigning condition class values.

Location Class

Location Class is based on the functional and aesthetic contribution, which the tree makes to the site, the placement of the tree on the site, and the importance of the location in the landscape context of the community. This factor can be rated at any percentage from 1% to 100 %. Table 4 can be used as a beginning point by assigning a value based on location. Judgement will be required to incorporate functional, aesthetic, and placement quality into the value. Use these considerations to determine a specific value from the ranges presented in the table. The elements of location class are:

1. Site location. Identical trees on two different sites may be valued quite differently. For example, a large, healthy tree in a remote location on a golf course fairway would not rate as highly as the same tree in a residential yard.

2. Functional and aesthetic value. Trees function as visual screens, windbreaks, climate moderating elements, architectural elements, sculpture, background, framing and unifying elements, in air purification, and can provide cover for wildlife. An evaluation of the tree's role in the landscape is essential to accurately assign a location value.

3. Plant placement. A plant's value may be diminished by a location, which interferes with utility lines, is deleterious to other trees, or is a safety hazard or public nuisance.

Table 2. Species Class Values for Some Indiana Landscape Trees.

Common Name	Botanical Name	Species Class
Evergreen Conifers		
Arborvitae (White Cedar)	*Thuja* spp.	60
*Cedar of Lebanon	*Cedrus libani*	100
Douglas Fir	*Pseudotsuga menziesii*	100
*False Cypress	*Chamaecyparis* spp.	80
Fir, Balsam	*Abies balsamea*	40
Fir, White	*Abies concolor*	100
Hemlock, Canada (eastern)	*Tsuga canadensis*	100
Juniper, Chinese	*Juniperus chinensis*	40
Juniper, American (red cedar)	*Juniperus virginiana*	60
Pine, Austrian	*Pinus nigra*	60
Pine, Eastern White	*Pinus strobus*	80
Pine, Jack	*Pinus banksiana*	20
Pine, Red (Norway)	*Pinus resinosa*	60
Pine, Scots	*Pinus sylvestris*	40
*Pine, Virginia	*Pinus virginiana*	20
Spruce, Black Hills	*Picea glauca* "Densata"	80
Spruce, Colorado Blue	*Picea pungens*	100
Spruce, Norway	*Picea abies*	100
Spruce, Serbian	*Picea omorika*	80
Spruce, White	*Picea glauca*	80
Yews	*Taxus* spp.	80
Broad-Leaved or Deciduous Trees		
Alder, Black	*Alnus glutinosa*	60
Ash, Blue	*Fraxinus quadrangulata*	20
Ash, Green	*Fraxinus pennsylvanica*	20
Ash, Green, Seedless and Cultivars	*Fraxinus pennsylvanica subintegerrima*	20
Ash, White	*Fraxinus americana*	20
Bald Cypress, Common	*Taxodium distichum*	100
Beech, American	*Fagus grandifolia*	100
Beech, European	*Fagus sylvatica*	100
Birch, Cutleaf European	*Betula pendula* "Gracilis"	20
Birch, European White	*Betula pendula*	20
Birch, Paper (White)	*Betula papyrifera*	20
Birch, River	*Betula nigra*	80
Blackhaw	*Viburnum prunifolium*	80
Boxelder (Male Tree)	*Acer negundo*	40
(Female Tree)		20
Buckeye, Ohio	*Aesculus glabra*	60
Buckthorn, European	*Rhamnus cathartica*	40
Buckthorn, Glossy	*Rhamnus frangula*	20
Butternut	*Juglans cinerea*	40
Catalpa, Northern	*Catalpa speciosa*	20
Catalpa, Southern	*Catalpa bignonioides*	20
Cherry Plum	*Prunus cerasifera*	40
Cherry, Black	*Prunus serotina*	40
Cherry, Pin	*Prunus pennsylvanica*	40
Chestnut, Chinese	*Castanea mollissima*	80
Chokecherry	*Prunus virginiana*	20
Chokecherry, Shubert's	*Prunus virginiana* "Shubert"	40
Coffee-tree, Kentucky	*Gymnocladus dioicus*	80
Corktree, Amur	*Phellodendron amurense*	100
Cottonwood, Eastern	*Populus deltoides*	40
Crabapples (Ornamental)	*Malus* spp	
(Scab resistant)		100
(Scab susceptible)		40
Cucumbertree	*Magnolia acuminata*	60
Dogwood, Alternate-leaved	*Cornus alternifolia*	80
Dogwood, Flowering	*Cornus florida*	100
Dogwood, Japanese	*Cornus kousa*	100
Elm, American	*Ulmus americana*	20
Elm, Siberian	*Ulmus pumila*	20
Elm, Slippery (Red)	*Ulmus rubra*	20
Ginkgo (Male Tree)	*Ginkgo biloba*	100
(Female Tree)		80
*Golden Chain Tree	*Laburnum* x *watereri*	80
Goldenraintree	*Koelreuteria paniculata*	60
Gum, Black	*Nyssa sylvatica*	100
Hackberry	*Celtis occidentalis*	60
Hawthorns	*Crataegus* spp.	
(rust resistant)		100
(scab resistant)		80
Hickory, Bitternut	*Carya cordiformis*	60
Hickory, Shagbark	*Carya ovata*	60
*Holly, American	*llex opaca*	80
Honeylocust, Common	*Gleditsia triacanthos*	40
Honeylocust, Thornless and Cultivars	*Gleditsia triacanthos* var. *inermis*	60

Table 2. (continued)

Common Name	Botanical Name	Species Class
Broad-leaved or Deciduous Trees (continued)		
Hornbeam, American	*Carpinus caroliniana*	100
Horsechestnut, Common	*Aesculus hippocastanum*	80
Horsechestnut, Red	*Aesculus carnea*	80
Ironwood	*Ostrya virginiana*	80
Katsura Tree	*Cercidiphyllum japonicum*	100
Larch, Eastern (Tamarack)	*Larix laricina*	40
Larch, European	*Larix decidua*	100
Larch, Japanese	*Larix kaempferi*	100
Lilac, Japanese Tree	*Syringa reticulata*	80
Linden, American (Basswood)	*Tilia americana*	60
Linden, Greenspire	*Tilia cordata* "Greenspire"	100
Linden, Littleleaf	*Tilia cordata*	80
Linden, Redmond	*Tilia x euchlora* "Redmond"	100
Locust, Black	*Robinia pseudoacacia*	20
Magnolia, Saucer	*Magnolia soulangiana*	60
*Magnolia, Southern	*Magnolia grandiflora*	80
Magnolia, Star	*Magnolia Stellata*	100
Maple, Amur	*Acer ginnala*	80
Maple, Black	*Acer nigra*	100
Maple, Hedge	*Acerr campestre*	100
*Maple, Japanese	*Acer palmatum*	100
Maple, Norway & Cultivars	*Acer platanoides*	100
Maple, Red and Cultivars	*Acer rubrum*	80
Maple, Silver	*Acer saccharinum*	40
Maple, Sugar	*Acer saccharum*	100
Maple, Sycamore	*Acer pseudoplatanus*	60
Maple, Tatarian	*Acer tatarica*	80
*Maple, Trident	*Acer buergeranum*	100
Mountain Ash, American	*Sorbus americana*	60
Mountain Ash, European	*Sorbus aucuparia*	40
Mulberry, Red	*Morus rubra*	20
Mulberry, White		
(Fruiting Tree)	*Morus alba*	20
(Fruitless Cultivar)		60
Nannyberry	*Viburnum lentago*	80
Oak, Black	*Quercus velutina*	80
Oak, Bur	*Quercus macrocarpa*	100
Oak, Chestnut	*Quercus muehlenbergii*	100
Oak, Northern Red	*Quercus rubra*	100
Oak, Pin	*Quercus palustris*	80
*Oak, Post	*Quercus stellata*	60
Oak, Red	*Quercus rubra*	100
Oak, Scarlet	*Quercus coccinea*	80
Oak, Shingle	*Quercus imbricaria*	100
Oak, Shumard	*Quercus shumardii*	80
Oak, Swamp Chestnut	*Quercus michauxii*	80
Oak, Swamp White	*Quercus bicolor*	100
Oak, Upright English	*Quercus robur* "Fastigiata"	60
Oak, White	*Quercus alba*	100
*Oak, Willow	*Quercus phellos*	80
Osage Orange	*Maclura pomifera*	40
Pawpaw, Common	*Asimina triloba*	60
*Peach, Flowering	*Prunus persica*	60
Pear, Callery Cultivars	*Pyrus calleryana*	80
Persimmon, Common	*Diospyros virginiana*	60
*Planetree, London	*Plantanus x acerifolia*	40
Plum, American	*Prunus americana*	40
Poplar, Bolleana	*Populus alba* "Bolleana"	40
Poplar, Lombardy	*Populus nigra* "Italica"	20
Poplars	*Populus* spp.	40
Purple-leaf Sand Cherry	*Prunus* x *cistena*	40
Redbud, Eastern	*Cercis canadensis*	40
Redwood, Dawn	*Metasequoia glyptostroboides*	100
Russian-olive	*Elaeagnus angustifolia*	40
Sassafras, Common	*Sassafras albidum*	80
Scholar Tree, Chinese	*Sophora japonica*	80
Serviceberry	*Amelanchier* spp.	80
Sourwood	*Oxydendrum arboreum*	80
Sumac, Staghorn	*Rhus typhina*	80
Sweet -gum	*Liquidambar styraciflua*	80
Sycamore, American	*Platanus occidentalis*	40
Tree-of-heaven	*Ailanthus altissima*	20
Tulip-tree	*Liriodendron tulipifera*	60
Walnut, Black	*Juglans nigra*	80
Willows	*Salix* spp.	20
Yellowwood, American	*Cladastris lutea*	60
*Zelkova, Japanese	*Zelkova serrata*	80

*Winter hardiness limits this tree's useful range to the southern portion of Indiana. Its species class in northern areas is 20-40 points lower than the charted value.

Table 3. Condition Class for Shade and Ornamental Trees.

Condition	Description	Condition Class	Values for use in formula
Excellent	Perfect specimen. Excellent form and vigor for species. No pest problems or mechanical injuries. No corrective work required. Minimum life expectancy 30 years beyond the time of inspection.	100	1.0 range 1.0-0.9
Good	Healthy and vigorous. No apparent signs of insect, disease, or mechanical injury. Little or no corrective work required. Form representative of species. Minimum life expectancy 20 years.	80	0.8 range 0.9-0.7
Fair	Average condition and vigor for area. May be in need of some corrective pruning or repair. May lack desirable form characteristics of species. May show minor insect, disease, or physiological problems. Minimum life expectancy 10 years.	60 or 40	0.6 or 0.4 range 0.7-0.3
Poor	General state of decline. May show severe mechanical, insect, or disease injury, but death not imminent. May require major repair or renovation. Minimum life expectancy 5 years.	20	0.2 range 0.3-0.1
Dead or Dying	Dead, or death imminent within 5 years	0 range 0.1-0.0	0.0

Table 4. Site Location Values for Shade and Ornamental Trees.

Site Location	Location Class	Values for use in Formula*
Specimen or historical trees	100	0.9-1.0
Average residential, landscape trees	80-90	0.8-0.9
Malls and public area trees	70-80	0.7-0.8
Arboretum, park and recreation trees	60-80	0.6-0.8
Golf course trees	60-80	0.6-0.8
City street trees	60-80	0.6-0.8
Environmental screen trees	60-80	0.6-0.8
Industrial area trees	50-70	0.5-0.7
Out-of-city highway trees	40-60	0.4-0.6
Native, open woods trees	20-40	0.2-0.4

*Functional or placement deficiencies will reduce site location values.

Examples

1. A 10" diameter Sugar Maple, excellent health and form, specimen tree in a city park. Local nursery estimate for a 2" diameter replacement tree, installed, is $200.

Base Value: 2" tree = 3.1 in^2 cross section area; $200 ÷ 3.1 in^2 = $64.50/$in^2$

Cross Section Area: 10" tree = 78.5 in^2 (from table) [or $10^2 \times 0.7854 = 78.5$ in^2]

Species Class: 100 (use 1.0 in formula)

Condition Class: 100 (use 1.0 in formula)

Location Class: 60-80, Select 70 (use 0.7 in formula)

Computation: $64.50/$in^2 \times 78.5$ $in^2 \times 1.0 \times 1.0 \times 0.7 = $3544

2. A 40cm Silver Maple, good health and form, specimen in residential yard. Local nursery estimate for a 3cm diameter replacement tree, installed, is $50.

Base Value: 3cm tree = 7.07 cm^2 cross section area; $50 ÷ 7.07 cm^2 = $7.08/$cm^2$

Cross Section Area: 40cm tree = 1256 cm^2 (from table) [or $40^2 \times 0.7854 = 1256.6$ cm^2]

Species Class: 40 (use 0.4 in formula)5

Condition Class: 80 (use 0.8 in formula)

Location Class: 90 (use 0.9 in formula)

3. A 4" Red Oak, excellent health and form, specimen tree along city street. Local nursery estimate for a 1.5" diameter replacement tree, installed, is $500.

Base Value: 1.5" tree = 1.77 in^2 cross section area; $500 ÷ 1.77 in^2 = $282.49/$in^2$

Cross Section Area: 4" tree = 12.6 in^2 (from table) [or $4^2 \times 0.7854 = 12.57in^2$]

Species Class: 100 (use 1.0 in formula)

Condition Class: 100 (use 1.0 in formula)

Location Class: 80 (use 0.8 in formula)

For more information on the subject discussed in this publication, consult your local office of the Purdue University Cooperative Extension Service.