

What is Your Tree Worth?

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The urban forest makes our cities livable. In order to have a healthy canopy in our cities we need to appreciate trees, understand the benefits they provide, and provide them with appropriate care.

- Trees and other landscape plantings are an important part of a well-planned urban design. Landscape designs ranked as good or better can increase property values 4-5 percent. On the other hand, poorly placed or selected plant material can lower property values by 8-10 percent.
- Real estate assessors recognize that a house on a lot with trees or in a neighborhood with mature trees is up to 20 percent more saleable.
- Attractive landscapes have a restorative value for human health.
- Communities with an extensive urban forest have lower crime rates.
- Street trees in urban business districts have higher retail sales. The increased taxes generated can pay for the municipality's cost of installing and maintaining these trees.
- Trees have heating and cooling benefits for our homes and offices,

sequester carbon dioxide, mitigate airborne pollutants, and reduce stormwater runoff.

All of these benefits have monetary values that can be calculated. It is even possible to place a value on intangible benefits, such as the enjoyment of a cool summer breeze and the relaxing sound of wildlife in the landscape.

Occasionally, through no fault of your own, your valuable trees and landscape plants may be damaged. Landscape appraisers are called on to assess individual plants and entire landscapes as a result of storms, human damage, destruction, and failure. Appraisals are an estimate of the nature, quality, value, or utility of an interest or an aspect of real estate. An accurate assessment of a tree's value can often aid in recouping partial or complete losses from insurance companies, the Internal Revenue Service, or from another individual. Should a disagreement develop over the value of the loss, it may be necessary to litigate the disagreement in court or by arbitration. Therefore, all appraisals must be unbiased and honest estimates of the plant's value.

The monetary value of your tree should only be calculated by an arborist trained in this discipline. When damaged by someone else, the value of your tree or shrub is probably less than what you think it should be and more than what your neighbor thinks it is worth. An assessment necessitates that a trained individual examine the vigor and vitality of the plant or landscape, its stability, appropriateness for the site, contribution to the design as well as the presence of insects, diseases, deadwood, or decay. Accurate valuations cannot be done solely with the aid of images.

Assessment Techniques

Three distinctly different techniques are used for assessing the value of property; **cost approach**, **income approach**, and **market approach**. The assessment method will depend on the type of property, how the property is used and reason for the assessment. It is essential that the assessor be able to determine what the plant looked like prior to the loss.

The need to assess landscape plants may arise because of accidental damage, malicious damage or an act of nature. Damage resulting from willful and wanton intent to cause harm may be subject to treble damages (tripling of assessed values) under Kentucky law. The courts can also assess additional judgements for sentimental or historical values.

This article is not intended as and does not represent legal or arboricultural advice. It is intended solely as an overview of the process of assessing the monetary value of trees and landscape plantings. Information in these articles should not be relied upon to take the place of legal or arboricultural advice. In all issues involving property rights and trespass you are advised to consult a qualified legal professional.

Cost Approach

When assessing property, real estate appraisers consider the estimated cost of land plus current cost of construction. The cost of depreciation is subtracted from this value to give an estimate of the current value. With landscape plants this is calculated as the cost of replacement or the calculation of the current value for plants too large to transplant. The condition of the plant, location, and species are depreciation factors.

The Cost Approach is sub-divided into four methods: **replacement cost**, **trunk formula method**, **cost of repair**, and **cost of cure**. The method selected is dictated by the specifics of the site. It is often beneficial to calculate a loss using two or more methods.

Replacement Cost: The easiest to calculate and often most appropriate method for the cost approach is the replacement cost. This involves the cost of finding, purchasing, transporting, and installing the largest commonly available plant(s) of the species lost or a similar species. These replacement plants are up to the size of the individual plant(s) lost. The cost of supplemental care necessary for newly transplanted specimens to become reestablished and a guarantee that the plant is alive and healthy for a period of time (usually at least one to two years) after transplanting is added to the cost of obtaining and installing the replacement plant(s). Supplemental costs such as insurance, fees and permits, overhead, and profit are part of this cost. The cost of removal of the old tree and restoration of the area to its former condition is also included as expenses involved with the replacement method. Depreciation of this amount for previously over-planting in the landscape is acceptable.

Trunk Formula Method: This is the second technique for calculating the Cost Approach. It considers the species, condition, size, and location. It is one of the most commonly used and most commonly misused techniques for assessing values of plants in landscapes.

- **Species Factor:** The value of a plant species varies with geography. Plants hardy in southwestern Kentucky are in a different USDA plant hardiness zone (<http://planthardiness.ars.usda.gov/PHZMWeb/>) than northern counties. The rating factor for each species is determined by a committee of plant materials experts familiar with the performance of that species within a defined geographic region. Hardiness ratings can vary between different

cultivars of the same species. The rating system considers the genetically controlled characteristics of a species and is not related to the condition under which a specific individual is growing. This species rating list is not highly defined to distinguish between different ecological areas within a geographic region. It usually does not go below the species epithet level. A range (i.e. 60-70 percent) is given for each species. The lower portion of the range is assigned to a seedling-grown plant. The higher end of the range is for more horticulturally desirable selections known as cultivars. Factors influencing the acceptability of a species include:

- » Climate adaptability to heat/cold hardiness, frost tolerance, drought tolerance, storm (ice, snow, wind) tolerance.
- » Growth characteristics: tolerance to different sites, vigor, structural strength, aesthetics, life expectancy, pruning requirements, potential to be invasive.
- » Soil adaptability to structure and texture, drainage, moisture, acid/alkaline, mineral element (nutrients).
- » Resistance/tolerance to diseases, insects, air pollution

There are sites where growing conditions are so unfavorable (i.e. extreme pH or moisture relations) that only one or a very limited number of species can survive. Under these adverse conditions an assessor can adjust the species rating list.

- **Condition:** The condition of a plant is assessed by considering its current health and structural integrity prior to being damaged or destroyed. Trees with an imminent or probable risk of failure with the potential to cause harm should not have a valuation performed. They should be assessed by an individual qualified in performing an International Society of Arboriculture (ISA) Tree Risk Assessment®.

Factors influencing condition include but are not limited to:

- » **Structural Integrity:** broken or dead roots, raised soil, broken or dead branches, decay, codominant

stems, included bark, asymmetrical growth. Structural integrity is rarely an issue with shrubs and vines. These plants are generally assessed only on their health and abiotic disorders.

- » **Plant Health:** Mature size, leaf color and size, shoot elongation, and factors that could result in a high potential for failure in the future.
- » **Abiotic Disorders:** physical injury to the plant, chemical damage, limited growing space, improper installation, or poor maintenance practices

A numerical system assigns a score for condition by evaluating roots, trunk, scaffold branches, small branches and twigs, foliage, and buds. Consult the *Guide for Plant Appraisal* (9th ed.) pg. 34-35. A Tree Risk Assessment® may accompany the valuation.

(The Guide for Plant Appraisal is a guide, not a standard. It provides several approaches and methods for recognizing values for trees and landscapes. Arborists recognize this and may, with cause, deviate from the guide. Attorneys, judges, and others may consider this as the de facto standard for valuation of plant material in the United States. The Council of Tree and Landscape Appraisers acknowledges that the Guide serves as the de facto standard for plant appraisal.)

- **Size:** Size of trees is usually expressed by the height, trunk diameter and/or canopy spread. The size of shrubs and conifers is usually expressed as height and canopy spread. Trees that are too large to easily transplant are measured as cross sectionally area of the trunk. These measurements are taken at locations determined in Table 1.

Table 1. Measuring trees' diameter.

Height above Ground for Taking Diameter	Trees
6 inches (15 cm)	Up to 4 inches (10 cm) in diameter
12 inches (30 cm)	Not too large to transplant
4.5 feet (1.4 m)	Too large to easily transplant

The area of the trunk is calculated by squaring the radius (half the diameter) and multiplying by pi (3.14~). D-tapes are frequently used to obtain the

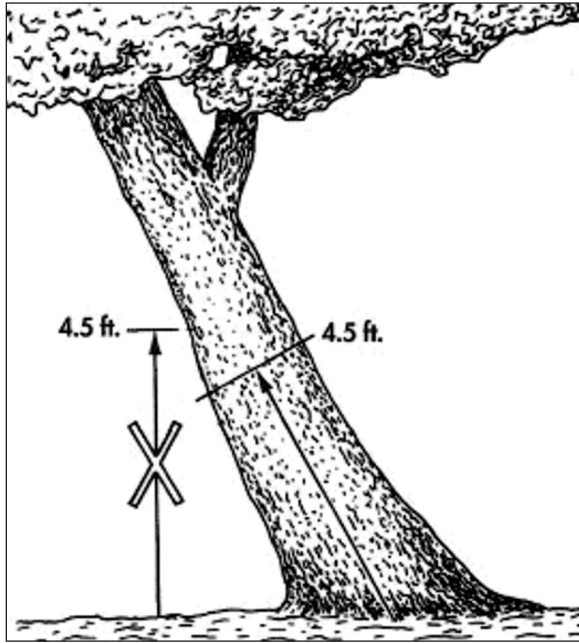


Figure 1. If the tree is leaning, the diameter is measured 4.5 feet above the high point of the trunk and perpendicular to the axis of the trunk. Source: Guide for Plant Appraisal

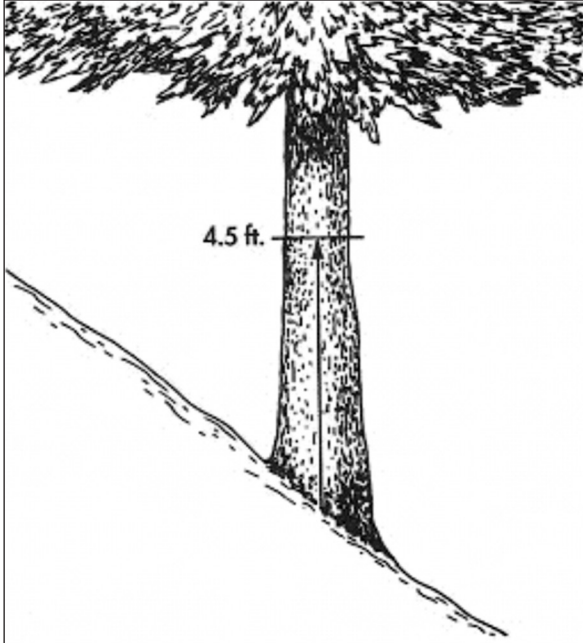


Figure 2. If the tree is growing on a slope, the diameter is measured 4.5 feet above the point half way between the upper and lower side of the slope. Source: Guide for Plant Appraisal

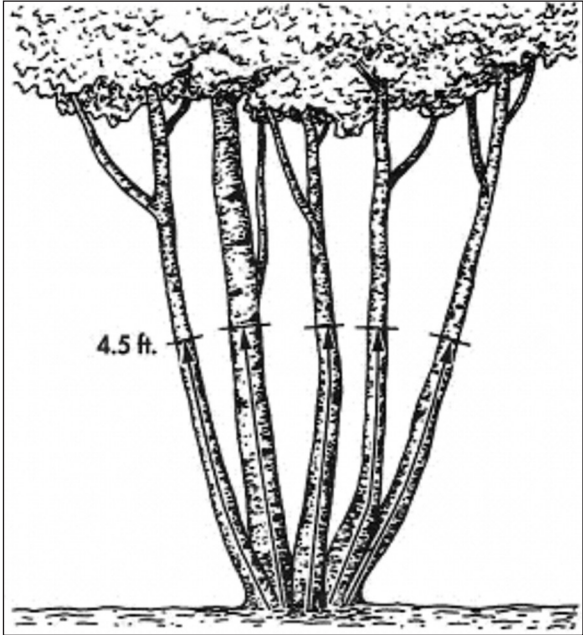
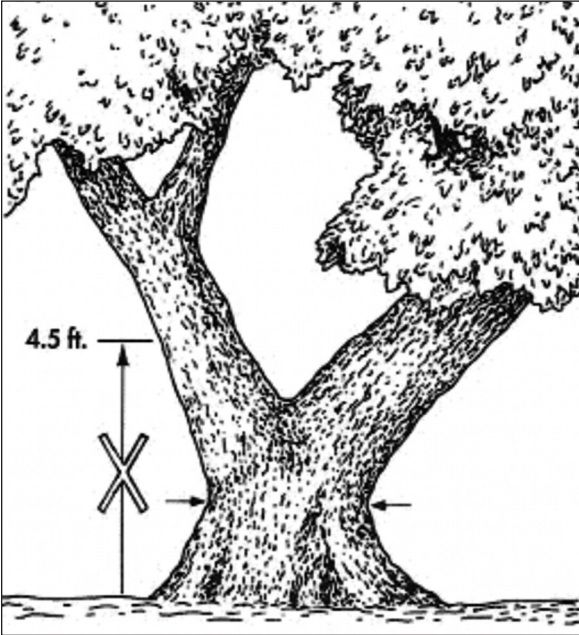


Figure 3. Branches of trees that fork below 4.5 feet above the ground (3a) or are multi-stemmed/branching at the ground (3b) are measured individually at 4.5 feet above the ground. The cross-sectional area of each branches is summed. Source: Guide for Plant Appraisal

diameter (figures 1-3). These tapes are wrapped around the circumference of the trunk. The tape is calibrated to read out as the diameter.

Trees with elliptic cross sections will have a smaller cross sectional area than trunks that are circular. Elliptic trunks must be calculated using the formula:

$$\text{Area} = (0.785) \\ (\text{largest diameter}) (\text{smallest diameter})$$

Sometimes trees are no longer on the site and images are not available. In situations where only the stump remains the diameter of the remaining can be compared to trees of the same species and similar size in the region.

Trees reach an economic and aesthetic maturity. To prevent the annual increase in size from exceeding the contribution to the value of the landscape, an adjusted trunk area value is used for trees exceeding 30 inches (76 cm) in diameter. Consult page 39 of the *Guide for Plant Appraisal* (9th ed.).

- Location: In combination with species, condition and size; the site characteristics are important in calculating value. The assessor considers the contributions and placement of the tree on the property. The benefits offered by a tree will be influenced by its size, shape, branch structure, foliage density, and distribution. A planting may function as privacy or visual screening, wind reduction, snow deposition, dust control, erosion control, wildlife habitat, or characteristics that influence energy conservation. Placement can be a negative value when litter from fruit etc. becomes an issue.

- » The loss of a single specimen tree is more significant than the loss of a tree from a cluster. The loss of a tree placed to reduce the effect of winter winds would be more significant than an identical tree in a park. The loss of a tree from a fence row is less critical than if it had been in a managed landscape. Trees that are not in managed landscapes may be assessed for their value as timber or firewood.

- » The location rating is derived by averaging the ratings for the site rating, contribution, and placement. Consult Page 54 of the *Guide for Plant Appraisal*.

Cost per square inch is calculated by looking at the cost of the largest available tree, installed and guaranteed for 1 or 2 years. This cost is divided by the number of square inches of trunk area. For Kentucky, \$50 per square inch is used as an average for ornamental trees. The assessor has the option of recalculating this based on a unique species.

The trunk formula is calculated by multiplying each of the following:

- » The dollar value per square inch (\$50.00)
- » The number of square inches of trunk diameter
- » Percent value for the species
- » Percent value for the condition
- » Percent value for the location

The trunk formula method is only used for trees. Shrubs and vines must be assessed by another method since trunk diameter is not a consideration.

Trees that are not highly desirable (e.g. invasive, produce odoriferous fruit, messy, etc.) or in poor condition in locations where they are not considered desirable may have a negative value. Specifically, the damaged or destroyed tree would cost more to remove than it was worth prior to being damaged.

Assessors sometimes assign a value to one or more plants in a landscape that is excessively high when compared to the market value of the property. The value assigned to a plant cannot exceed the change in sales value for the property.

It should be noted that as of this writing, the IRS does not accept the trunk formula method for evacuating loss.

Cost of Repair - This is the third technique for calculating the Cost Approach. This method is used when it can be determined that, with the use of accepted industry standards (i.e. good cultural practices), the tree can be expected to return to a condition and appearance similar to what it was prior to the damage. Any difference in appraisal between the condition before

and after the damage occurred is added to the cost of all treatments prescribed for the plant.

Cost of Cure: This is the fourth technique for calculating the Cost Approach. It involves all treatments and activities necessary to return a property, not just a single tree to a reasonable approximation of its previous condition. This may involve debris removal and disposal, restoration of plant material, cost of repair of damaged plants, removal of competitive species, restoration of hardscape items (i.e. walks), labor, equipment, permits, licenses, and other expenses necessary to recreate the intended active or passive use of the area. Delicate ecosystems may necessitate the more expensive and time consuming use of hand labor rather than large equipment for removal of debris.

The cost of cure for a property may include replacement cost, trunk formula method, cost of repair, and cost of cure. Arborists, foresters, horticulturists, landscape architects, and other green industry professionals trained in plant health care are the most qualified individuals for accomplishing these assessments.

Income Approach

The second technique used for placing a value on plants considers the potential for the damaged or destroyed plants to produce income. This is the value of the plant or its products at the time of damage with the consideration for future income. This can be summed up by the formula:

$$\text{Annual income} \div \text{Rate of return} = \text{Value}$$

Examples of sites where the income approach is used include production nurseries, Christmas tree farms, orchards, and timber stands. This technique is used more frequently by real estate appraisers and accountants than green industry professionals. The final compensation is generally determined by the legal system with consultation from individuals with experience in marketing and economics. The time considered in determining income is

generally only until replacement plants begin to produce yields equal to the lost crop.

Market Approach

The third technique is used to compare the value of a damaged or destroyed property to similar properties. It is sometimes referred to as the **Sales Comparison Approach**. The courts often consider this the most reliable estimate of the real value of property because it is based on what someone else was willing to pay for a similar property.

No two properties are ever exactly identical so adjustments are allowed with the market approach. This method uses property sales to compare the estimated contribution that plants and landscapes make to the actual value. Because of the complexity of this approach it should only be considered with the assistance of qualified, licensed real estate appraisers.

The three approaches (cost, income, and market) used to assess the value of plant material and entire landscapes (Table 2) should only be used by individuals knowledgeable in their professions. The four subdivisions under the Cost Approach are the methods most frequently used by green industry

professionals. Consult an accountant or real estate professional for the Income and Market Approach. Not all losses are covered legal deductions by the Internal Revenue Service or insurance policies. It would be prudent to consult an attorney in issues related to property law.

Table 2.

I. Cost Approach			
			<ul style="list-style-type: none"> • replacement cost • trunk formula method • cost of repair • cost of cure
II. Income Approach			
III. Market Approach			
\$50 per square inch			
Size	Square inches	Wholesale	Installed ++ (wholesale x 2.25)
4-in diameter @ 6 inches	12.56 in ²	\$279	\$628
5-in diameter @ 1 foot	19.625 in ²	\$436	\$981
6-in diameter @ 1 foot	28.26 in ²	\$622	\$1400

References

- Currid, Peggy (ed). *Guide for Plant Appraisal* (9th ed). International Society of Arboriculture, Council of Tree and Landscape Appraisers. 2000.
- Internal Revenue Service (US) Publication 547: *Casualties, Disasters, and Thefts* (<https://www.irs.gov/uac/About-Publication-547>)