CITY OF BLOOMINGTON
parks and recreation
Urban Forestry

The City of Bloomington Tree Care Manual

A Handbook for the Care of Urban Trees

The City of Bloomington Tree Commission

This educational brochure was prepared with funding assistance from the Indiana Department of Natural Resources Urban Forestry Conservation Grant. Text was authored by Gina A. Darnell, Professional Forester, Forest Resource Planning; and Lee Huss, City of Bloomington Urban Forester.

Third Edition February 2015

Message from the Mayor

In a city full of trees, the planting of a single tree still resonates powerfully with the people of Bloomington. As Indiana's first Tree City USA, designated by the Arbor Day Foundation in 1984 and named a Tree City USA every year since then, Bloomington has proven again and again that we as a city value our urban trees for all the benefits they provide. Our courthouse square would not be the same were it not ringed with trees, and we are making every effort to protect Bloomington's matriarchs, magnificent ash trees in Seminary Park that have stood in silent witness to Bloomington's rich and colorful history for nearly 200 years.

Yet the number of trees that grow in our parks and along our city streets is small compared to the numbers of trees that flourish in homeowners' back yards. This third edition of the Tree Care Manual, developed by the dedicated members of the Bloomington Tree Commission with assistance from the City's urban forester, is a valuable tool filled with the technical information landowners need to properly care for the trees on their own property.

Trees touch us all, and they contribute greatly to our quality of life. A healthy, well-cared-for urban forest reflects its status as a valued resource by the community. We are fortunate here in Bloomington for organizations like the Bloomington Parks Foundation, who have been long-time advocates and ongoing financial supporters of the urban forestry program through the Memorial and Honorary Tree Program. Planting a tree in the memory of a loved one, or in honor of a treasured friend, truly is a lasting tribute. See pages 26 and 27 of this manual to learn more about the Bloomington Parks Foundation's tree fund and tree planting programs.

As long as the planting of a single tree still resonates powerfully with the people of Bloomington, we will continue to have trees to treasure in Bloomington for the ages to come.

Thank you,

Mark Kruzan, Mayor
City of Bloomington

Bloomington Mayor Mark Kruzan congratulates the owners and employees of Solution Tree in a ceremony in March 2011. The company committed to purchasing 150 trees for planting on Bloomington's city streets.

Special thanks to the members of the Bloomington Tree Commission:
Debra Beck
Kerry Bridges
Tom Coleman
Laurel Cornell
David Dilcher
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Bloomington Tree Care Manual
Third Edition, February 2015

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Bloomington Tree Care Manual
Third Edition, February 2015

Tree Care Manual

This Tree Care Manual specifies the correct standards of practice for tree planting and the care of trees in the city of Bloomington, Indiana. This manual, which serves as an arboricultural specifications manual, was prepared by the Bloomington Tree Commission and approved by the Board of Public Works and the Common Council of Bloomington.

IMPLEMENTATION OF TREE CARE STANDARDS

A municipal tree ordinance to establish a Tree Commission and to regulate the care of public trees has been in effect since 1992 in the city of Bloomington, and was most recently updated in 2007. The ordinance stipulates that all work on trees that lie in the public right of way shall comply with the standards set forth in this manual. While not mandatory, it is recommended that work on trees in the private sector follow these standards to assure a safe and healthy environment for the citizens of Bloomington.

ADOPTED POLICIES REGARDING TREE CARE

The designation of "Tree City" is one in which the government and citizens take pride and wish to see expressed in the actions and attitudes taken toward trees in the rights of way. A goal toward the expansion of tree cover in our urban environment serves to improve the city's economic vitality, improve air quality, buffer noise, moderate temperatures, increase wildlife habitat, and beautify the city. The responsibility for improving Bloomington's urban forest is a joint venture between government and citizens.

The Bloomington Tree Commission has adopted these policies, with a goal of improving the city:

- Encourage the use of proper preventive tree maintenance techniques to ensure long-lived trees, thereby reducing the need for tree removals.
- Expand the tree crown coverage in the city by maintaining existing trees and by planting new urban-tolerant trees, especially native species of shade trees.
- Increase public awareness of and involvement in urban forestry through educational efforts to promote landscaping and tree care on private properties.
- Encourage site designs to provide for the accommodation of trees with other infrastructure, such as utilities, parking lots, buildings, signs, streets, and sidewalks.

Recommended Standards of Tree Care Practice

PLANTING

TIPS FOR CHOOSING AND PLANTING CITY TREES

Whether you choose to plant a tree in your private yard or along the street on city property, there are important things to consider. The city of Bloomington strives to have many beautiful trees gracing its streets, but trees need to coexist in a safe manner with public infrastructure like utility lines, streets, sidewalks, buildings, and signs. Planting the right tree in the right place is key to having a successful urban forest.

Before planting any tree, look around to see how much room a tree would have to grow to mature size. Look at the space between the sidewalk and street, and above for power lines, phone lines, or street lights that should not be blocked. Be sure to pick the right size tree both for the location you are planting and for the size of buildings near the tree. Consider tree color both in spring and fall, the scale of the planting, and the final shape of a tree in designing your planting area.

Trees can be planted any time the ground can be worked. Spring is a good time to plant, while trees are not yet leafed out and newly planted trees can benefit from spring moisture. Late fall planting also allows roots to be established while trees benefit from winter moisture. Containerized trees can be planted in summer, as they have good root systems. Freshness and pre-planting care of tree stock are important for survival, as is weekly post-planting watering for a full growing season. Buy only quality trees that are healthy, well pruned, and have a strong central trunk. Bargain trees that have been left in hot sun or cold wind to dry out are not bargains when they die.

Always CALL 811 BEFORE YOU DIG to contact the free public service utility locate company. Underground utilities like phone, gas, electric, and cable TV will be painted or flagged in the vicinity of your digging hole. This locate service will also mark underground water and sewer lines in the public right of way area, but not in your yard. If planting a tree next to the street on public property, you must first obtain a Tree Work Permit from the Bloomington Parks and Recreation Department. This assures that the city urban forester can approve the siting of the tree and make sure that an appropriate tree species is selected. This will also assure that the tree is logged into the public tree inventory database.

SELECTING THE RIGHT TREE TYPE: SIZE IS IMPORTANT!

This manual contains the approved street tree species list (page 11), which is a list of tree types that are suitable for planting in Bloomington's climate. Trees are grouped into three size classes—small, medium, and large—based on their mature size. Tree species that appear in this list are also adapted to urban stresses such as road salt, limited grow spaces, and poor soils.

A size class should be chosen based on the growing space of the planting area. To determine what size planting space you have, refer to the "Distance from Infrastructure" section in each list. If you have a small growing space, choose a tree from the small tree type list; a medium space, a medium tree type; and a large space, a large tree type.

Also included is a list of trees (page 15) that are undesirable for planting in the city. These tree species usually have disease, pest, or litter problems that make them unsuitable in urban areas. Some species of trees are invasive in the natural environment due to prolific seeding or root sprouting and as a result should not be planted. The planting of monocultures of trees (lots of the same kind of tree) is discouraged because of potential insect and disease problems. The Bloomington Tree Commission highly encourages the use of native tree species from these lists (pages 11-17) when selecting trees to plant.

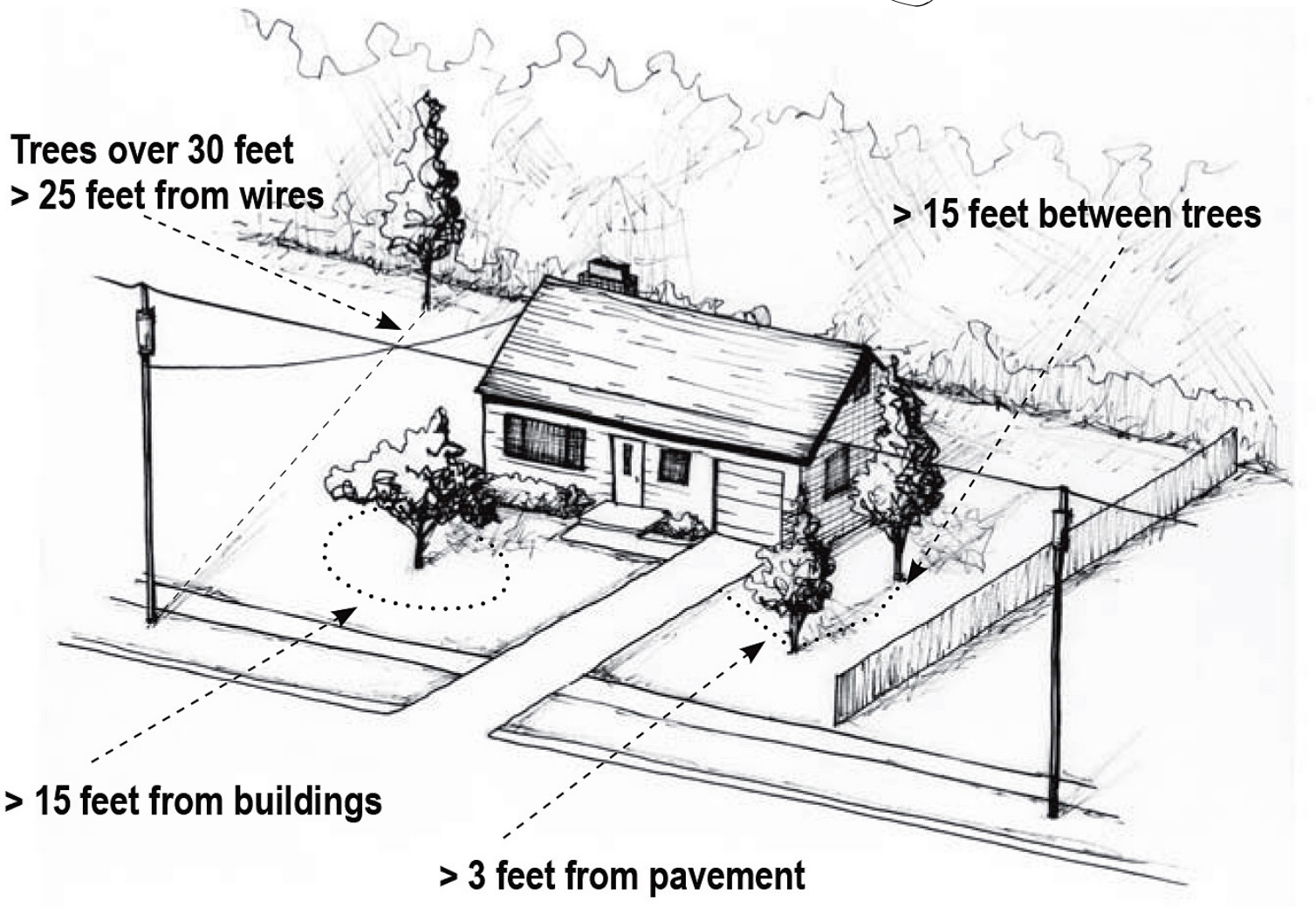
TREE PLACEMENT IN THE TREE LAWN

Placement guidelines for trees planted in relation to adjacent infrastructure are listed for each tree size class in the "Distance from Infrastructure" sections of the approved street tree species list (pages 11-17). Further, unless otherwise sanctioned by the Bloomington Parks and Recreation Department or the city's urban forester, the following standards will apply to trees or shrubs planted in the public right of way:

1. No vegetation which reaches a mature height of between 2½ and 8 feet shall be planted in the public right of way within 50 feet of the intersecting curb lines of a street corner.

2. No new tree shall be planted closer than 25 feet from the intersecting curb lines of a street corner on streets designated as local streets, 35 feet on streets designated as collector streets, and 60 fee on state highways or other arterial streets.

An excellent Web site for tree species information and photos http://forestry.ohiodnr.gov/trees.



PLANT MATERIAL HANDLING, INSPECTION, AND STORAGE

1. Only desirable, long-lived trees of good appearance, beauty, adaptability, and generally free from injurious insects and diseases shall be planted on public sites. Any trees planted shall be adaptable to USDA Zone 5 climate conditions.

2. Trees shall be tagged, indicating species and size. Trees shall be free of wounds, insects, and cankers. Root systems should be full and root balls should be moist, but not moldy. Trees in containers should not have encircling roots. Root balls should be protected from freezing and drying out.

3. Plants should be protected from wind during transport and be kept cool and moist at all times. Care should be taken to not drop or otherwise loosen the root ball. Trees should not be picked up by the trunk. Instead, the soil ball should be supported when moving the plant.

4. Bare-rooted plants must be planted when dormant (buds are closed and not leafed out). Roots should always be kept cool and moist and trees planted as soon as possible.

5. If stored, the trees should be covered with moist soil, straw, or wood chips. Bare-rooted trees should be soaked in water immediately prior to planting.

PLANTING PROCEDURES

Balled and Burlapped Trees

1. Hole should be dug with the width three times the spread of the root ball and no deeper than the root ball height. Sod should be removed from the site.

2. Trees should be planted no deeper than previously grown. The trunk flare at the base of the tree should not be buried. In clay soils trees can be planted slightly high, not to exceed 20% of the root ball height above ground level, with sloped backfill covering all roots. Set trees on native soil that is thoroughly compacted. Trees should be set gently into the hole without stress on the trunk or loosening the root ball.

3. Cut away twine only after tree is set in level position. Fold back burlap and wire basket below ground level. Remove all plastic twine.

4. Straighten tree and backfill ⅓ of hole with existing native soil. Avoid using excessive organic matter additives to the fill. If desired, at this time a solution of water with root stimulator-type fertilizer can be applied over the roots. Compact backfill with feet. Check tree straightness again, complete backfilling tree, and once again compact the backfill. Construct a three inch-high watering dike around the hole.

5. Apply water to settle the soil.

6. Chop up any dirt clods, add soil if needed.

7. Place a three-inch layer of mulch around the tree in a minimum two-foot radius. Do not pile mulch against the trunk. Instead, keep mulch at least three inches from the trunk.

8. Prune only broken branches. Trees do not normally need to be staked. Staking is recommended for trees with loose root balls, trees exposed to equipment damage, or trees exposed to high wind or high river conditions. Take care to not damage the root ball when staking and remove any supports before they grow into the tree.

Planting Trees in Landscapes
University of Florida
http://bit.ly/1JMUxGh

PLANTING PROCEDURES

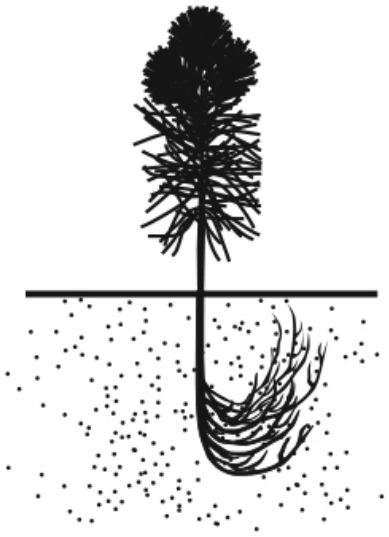
Bare-Rooted Trees

1. Plant trees immediately upon receipt. Keep roots cool and moist at all times.

2. Soak roots in water before planting. When planting trees larger than seedlings, tree roots should be soaked in a wetting gel solution.

3. Cleanly trim any long root hairs or broken roots.

4. Hold tree in hole at soil line, making sure roots are straight and not bent in a "J" shape or circling in the hole. Carefully pack soil firmly around the roots, and water. Plant tree at the previous planting depth for hardwood seedlings, slightly deeper for evergreen seedlings.



Make sure roots are not bent in a "J" shape or circling in the hole.

TREE CARE FOR NEW TREES

Watering

New trees should be supplementally watered for three years after planting. Plants should be thoroughly watered every five to 10 days from April through October as needed as a supplement to natural rainfall. Plants should receive a total of two inches of water every two weeks, or about 10 gallons per two-inch caliper tree. Watering is critical when summer temperatures exceed 90° F for extended days.

Fertilizing

Fertilizing is not usually necessary. At planting time, a high phosphorus "root stimulator" type fertilizer can be poured over the roots. If at any time the tree appears stressed, a water-soluble fertilizer like Miracle-Gro can be watered in.

Pruning

Newly planted trees should be pruned only as needed to remove dead, damaged, or poorly located limbs. After trees are established, usually a minimum of three years, structure pruning is recommended to promote a strong central tree leader and to remove lower branches as needed for clearance.

Wrapping

Only thin-barked trees such as young maples, linden, beech, and tulip poplars, which are subject to sunscald, should be protected November through April with specialty paper tree wrap material. Never use tape or plastic material. All wrapping should be removed during the growing season. Open bark wounds should not be wrapped but, instead, the bark should be trimmed cleanly and left open to air circulation. If the wound is fresh and the bark still partially attached, the bark can be pressed in place and gently wrapped to graft back in place.

Staking

Only those trees in windy, open areas, along floodplains, or with loose root balls should be staked to prevent movement of the base of the tree at the roots. Freedom of movement in a tree trunk helps a tree develop a stronger trunk. If staking, avoid cutting roots while driving the stake, or damaging bark with any rope or wire used. All staking materials should be removed after one year from installation.

Mulching

Mulch should be applied at time of planting and reapplied annually in the spring. Mulch a depth of three inches for a minimum two-foot radius around the tree. Do not pile mulch against the trunk. Instead, keep mulch two to three inches away from the trunk. Recommended mulch is shredded bark or aged wood chips.

CHOOSING AN ARBORIST

Why hire an arborist? An arborist is a specialist in the care of individual trees. Arborists are knowledgeable about the needs of trees and are trained and equipped to provide proper care. Hiring an arborist is a decision that should not be taken lightly. Proper tree care is an investment that can lead to substantial returns. Well-cared-for trees are attractive and can add considerable value to your property. Poorly maintained trees can be a significant liability. Pruning or removing trees, especially large trees, can be dangerous work. Tree work should be done only by those trained and equipped to work safely in trees.

Find a Certified Arborist
www.isa-arbor.com

REGULATIONS SUMMARY

The following regulations apply to tree pruning activities on public street trees, whether done by the individual or his/her contracted agent. Refer to the Tree Ordinance at bloomington.in.gov/treecare for more information.

1. Any citizen pruning a public street tree by removing branches over three inches diameter in size is required to obtain a Tree Work Permit (page 18) from the Bloomington Parks and Recreation Department or the city urban forester prior to pruning activities.

2. To facilitate the flow of traffic and pedestrians, trees overhanging the street shall be pruned for a clearance of 15 feet and trees and shrubs overhanging the sidewalk shall be pruned for a clearance of eight feet.

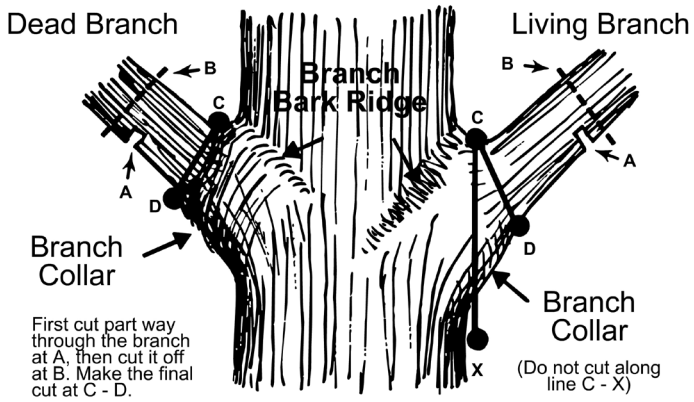
3. No tree topping is allowed. To reduce the crown of a tree, crown reduction pruning should be used, which is accomplished by pruning back the tree leaders and branch terminals to lateral branches that are large enough to assume the terminal roles (at least ⅓ the diameter of the cut stem). In simpler terms, always cut back to the "Y" of a limb.

4. Any persons or firm engaging in the business of pruning, treating, or removing trees shall be bonded and insured as currently required by the city.

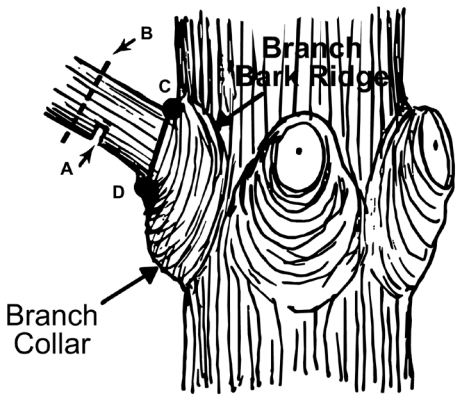
5. Proper pruning techniques and practices will be used, as set forth in the Tree Pruning Guidelines prepared by the International Society of Arboriculture (ISA).

6. Safe tree pruning practices shall be followed. Acceptable Tree Care Safety Standards can be found on the Web by researching document ANSI Z133.1-2006 from the American National Standards Institute. This document lists the current national safety standards for arboricultural operations.

Proper Pruning Principles



Hardwoods



Conifers

Arbor Day Foundation®

APPROVED PRUNING TECHNIQUES

These techniques should be used, for whatever the pruning goals.

Crown Cleaning is the removal of dead, dying, or diseased, crowded, weakly attached, and low-vigor tranches from the crown of a tree.

Crown Thinning is the selective removal of branches to increase light penetration and air movement through the crown. Thinning opens the foliage of a tree, reduces weight on heavy limbs, and helps retain the tree's natural shape.

Crown Raising removes the lower branches from a tree in order to provide clearance for buildings, vehicles, pedestrians, and vistas.

Crown Reduction reduces the size of a tree, often for clearance for utility lines. Reducing the height or spread of a tree is best accomplished by pruning back the leaders and branch terminals to lateral branches that are large enough to assume the terminal roles (at least ⅓ the diameter of the cut stem).

Tree topping is not an accepted pruning method.

NO TREE TOPPING ALLOWED

Topping is defined as the severe cutting back of major limbs to stubs larger than three inches in diameter within the tree's crown to such a degree as to remove the normal canopy and disfigure the tree.

To prevent the need for topping, start out by planting the right trees that will fit the available space. Begin pruning early to modify the structure of a tree as needed. Pruning early in the life of a tree can prevent the need for expensive mature tree pruning.

EIGHT GOOD REASONS NOT TO TOP A TREE

- cost
- ugliness
- insects and diseases
- tree starvation
- weak limbs
- rapid new growth
- tree shock
- tree death

More about topping and alternate pruning techniques at www.treesaregood.com/treecare

REMOVALS

TREE REMOVAL STANDARDS

1. All removals of street trees shall require a Tree Work Permit (page 18) from the Bloomington Parks and Recreation Department. Persons performing tree removals must meet all insurance and bonding requirements set forth in the Tree Ordinance.

2. Appropriate street and sidewalk barriers shall be placed where removals may endanger the public. The Department of Public Works shall be notified of any street blockages.

3. Care shall be taken in dropping trees to prevent sidewalk and curb damage.

4. The stumps of all trees shall be removed to at least six inches below ground level and the cavity shall be filled with soil and leveled.

PROTECTING TREE ROOTS

If a tree's roots are damaged, the tree is damaged and may succumb to an early death. Trees usually decline slowly and begin showing stress with dying tips of branches in the canopy. While roots extend well beyond the drip line or edge of a tree's canopy, there is a root area that needs special protection—the Critical Root Zone (CRZ). This is defined as a circular region measured outward from the tree's trunk representing the essential area of the roots that must be maintained or protected for the tree's survival. CRZ is a one-foot radial distance for every inch of tree diameter at breast height (DBH), with a minimum distance of eight feet. For very special trees, the formula changes to 1½ feet for every inch of DBH.

MATERIAL STORAGE

No dirt or materials, construction or otherwise, should be stored within the tree's Critical Root Zone for more than one week. Chemicals, oil or hot charcoals should never be disposed of in the CRZ under a tree. When grading yards, a layer of soil more than six inches deep will damage tree roots, as will the cutting of roots. Eighty percent of a tree's roots are in the top 18 inches of soil. Roots need to be close to the surface for oxygen needs.

Parking under trees causes soil compaction which hurts roots and stresses trees. During construction activities where vehicles will pass repeatedly under trees and over roots, a thick layer of wood chips can be placed temporarily on the path to prevent soil compaction.

SIDEWALK CONSTRUCTION AND REPAIR

Large trees in small grow spaces can cause sidewalk lift and a tripping hazard. Planting the right tree (or no tree) in a small space helps prevent this problem. Where tree and sidewalk conflicts already exist, there is unfortunately no perfect solution. Options range from sidewalk redesign to root pruning to tree removal.

Sidewalk lift is caused by both tree root expansion and by poor sidewalk condition. Sidewalks deteriorate with time and from seasonal movement from freezing and thawing. Tree roots can then grow into cracks and voids, raising pavement. By properly installing sidewalks with adequate base materials, the concrete will be less prone to both soil movement and tree root pressure.

Where sidewalk replacement and installation is performed, street trees affected will be evaluated by the city's urban forester to assess impact of construction on the tree health. Damage to sidewalks is not sufficient reason to remove a tree if present damage can be adequately corrected and future damage can be averted.

City zoning laws require sidewalks to be installed at a five-foot width. Any smaller width requires a variance through the Board of Zoning Appeals. Where tree root conflicts exist it may be possible to reduce sidewalk width and sill be in compliance with federal ADA sidewalk mandates. With city permission, sidewalks may be reduced to a width of three feet at a tree as long as there is a passing zone of five-foot sidewalk width within 200 feet of the tree area.

With permission from the city, it may be possible to install paving options such as paver bricks, asphalt, or rubber mats, or to ramp the site to avoid cutting tree roots. If tree roots are cut, they must be cut cleanly. It is also important that not too many roots are cut. The "four-by-four-by-four rule" noted in the next section is a good guideline for determining if a tree's support or health is compromised.

Roots exposed during construction should be kept moist. Wet burlap makes a good protective covering. For the year after a root pruning for sidewalk, sewer, or curb construction, a tree will benefit from an application within the tree root zone of nitrogen in the form of common grass fertilizer.

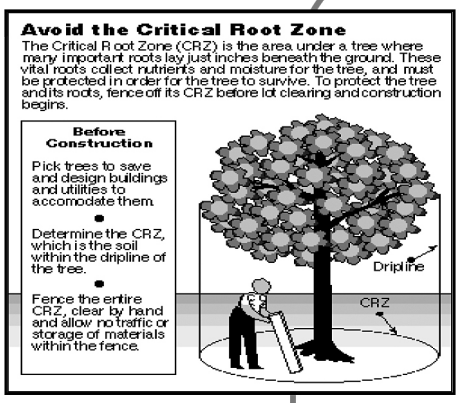
TRENCHING AND TUNNELING STANDARDS

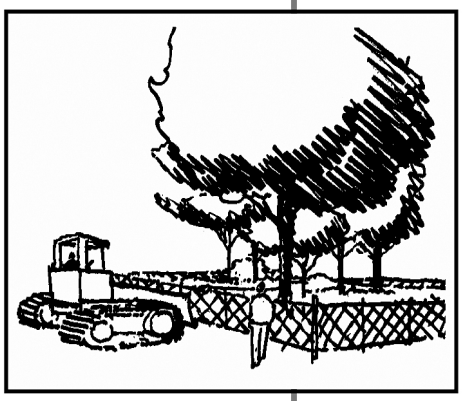
1. Any installation of underground public utilities shall employ, whenever physically able, tunneling instead of trenching within the Critical Root Zone area of any public tree.

2. All roots over two inches in diameter shall be cut cleanly. All trenches shall not stay open longer than necessary and shall be properly barricaded.

3. Four-by-Four-by-Four Rule: if any four tree roots four inches in diameter within four feet of the tree are cut, the tree should be removed because of increased tree wind-throw failure potential.

Tree Protection Guidelines





Tree Diameter (inches)	Structural Critical Rooting Distance (feet of radius)
1	1
2-4	2
3-5	3
6-7	4
8-9	5
10-11	6
12-14	7
15-18	8
19-23	9
24-36	10
37-45	11
50-55	12
60-65	13
70-75	14
80-85	15
90	16

The Critical Root Zone

One of the most critical and most successful steps in preserving trees that will remain on site during and after construction and development is to protect the trees roots from disturbance. For existing trees, there is a minimum amount of area, above (for the trunk and crown) and below ground (for soil health and the root system vitality), that is required to protect trees and preserve tree health. This area has been identified as the **Critical Root Zone (CRZ).**

*The **CRZ** can be defined as the circular area above and below ground with a **radius** equivalent to the greater of 6 feet or **1.5 feet for every inch in trunk diameter** at 4.5 feet above the ground.*

For example, a tree with a trunk diameter (dbh) of 10 inches has a CRZ of 15 feet (10 inches x 1.5) around the tree. While the radius of the CRZ is 15 feet, the diameter of the entire CRZ is 30 feet.

Trees that have been identified for preservation should be protected by:

- placing fencing around the CRZ,
- prohibiting all activity within that defined area, and
- posting the area with signs.

The Structural Critical Root Zone

Sometimes it is necessary to excavate or dig trenches to install curbs, irrigation systems, stormwater devices, wires, pipes, and other items within the CRZ and much closer to the tree trunk. The closer you get to the trunk, the more likely you will encounter a tree's large anchor roots.

Significant risk of catastrophic failure exists if structural roots within the CRZ are destroyed or severely damaged. The area where these large, anchor roots are most likely to be found is referred to as the Structural Critical Root Zone (SCRZ).

Use this table as a guide for determining how far to stay away from the trunks of trees while trenching or performing any kind of excavation. Knowing and respecting the SCRZ will help prevent cutting or damaging large support roots which could lead to unanticipated risks and liabilities, such as the tree falling over in a storm or simply from its own weight.

Many factors influence a tree's ability to withstand site disturbance, such as species, age, condition, and soil characteristics. The type, timing, and duration of the construction project itself also affect the outcome of tree protection efforts. Always consult with a Certified Arborist experienced with tree protection and risk assessment on construction sites.

Regional Contact: Aren Flint ▪ Brownsburg, Indiana ▪ 765-430-9020 ▪ aren.flint@davey.com
Corporate Contact: 1500 North Mantua Street ▪ Kent, Ohio 44240 ▪ 800-828-8312 ▪ www.davey.com

DAVEY RESOURCE GROUP
A Division of The Davey Tree Expert Company

TREATING WITH PESTICIDES

TREATMENT STANDARDS

1. Treating trees or flora with pesticides (herbicides or insecticides) shall be done only for the control of specific diseases or insects, with the proper materials, at the properly labeled dosage, and applied at the proper time to obtain the desired control, as specified by the chemical manufacturer. All spraying of pesticides shall conform to federal and state regulations.

2. Read the product label and follow all manufacturers' instructions in order to protect yourself and the public when using chemicals.

3. A Tree Work Permit (page 18) must be secured before treating with pesticides any trees or flora on the public street right of way or any public places. An Application for Permit to Treat Trees on Public Land for Emerald Ash Borer (page 19) must be submitted before treating ash trees on the public street right of way or any public place with an approved insecticide to protect the tree from EAB infestation.

OBTAINING A TREE WORK PERMIT

Obtaining a Tree Work Permit is required for any persons:

1. planting a tree in the public right of way, such as along the street;

2. removing any tree on a public right of way or public place;

3. pruning, within the public right of way, any tree where branches more than three inches in diameter will be removed;

4. excavating any ditches, tunnels, or trenches; or laying any drive; installing underground utilities; or storing any soil, stone, cement, or other substance within a 10-foot radius of any public tree;

5. treating with pesticides any tree(s) or flora on a public right of way or public place

Tree Work Permit applications are available in this manual on page 18 (Tree Work Permit) and page 19 (Permit to Treat Trees for Emerald Ash Borer); from the office of the Bloomington Parks and Recreation Department, located at 401 N. Morton St. Suite 250 inside City Hall, or online at bloomington.in.gov/treecare. Permit applications must be approved before work begins.

Bloomington Approved Street Tree Species Lists

Per the City of Bloomington Tree Ordinance, the following tables shall constitute the official street tree species acceptable for planting in Bloomington. These are the tree species with growth characteristics that do well on urban sites. All trees are suited for USDA cold hardiness Zone 5. The tables also include specifications for the minimum distances to be maintained between trees and other infrastructure when planting new trees within the public right of way.

TABLE 1 - SMALL TREE SPECIES FOR SMALL SPACES

Small trees are defined as those trees attaining a height of 20 to 30 feet at maturity.

DISTANCE FROM INFRASTRUCTURE

- Plant no closer than two feet from street, sidewalk, or curb.
- Minimum grow space of four feet of tree lawn.
- Small trees may be planted under overhead utility lines.
- Do not plant within five feet of any underground utility (phone, sewer, water, cable, electric).
- Do not plant within 10 feet of any utility pole or fire hydrant.
- Do not plant within three feet of a parking area unless vehicle wheel stops are provided.
- Trees should not be planted where traffic line of sight is compromised at intersections.
- Tree pruning may be required as the tree matures to maintain adequate street and sidewalk clearance.

MINIMUM SIZE

Trees planted in the public street tree lawn must be a minimum 1½-inch diameter caliper (caliper is measured six inches above ground level).

Common Name	Scientific Name	Recommended Cultivars
Allegheny Serviceberry	*Amelanchier laevis*	
American Hornbeam	*Carpinus caroliniana*	
Apple Serviceberry hybrids	*Amelanchier x grandiflora*	'Princess Diana' 'Autumn Brilliance'
Eastern Redbud	*Cercis canadensis*	Use single-trunk tree form on streets
Flowering Crabapple	*Malus sp.*	Many different types. See Table 2. Some native to the U.S., others Eurasia
Flowering Dogwood	*Cornus florida*	Plant only on sheltered sites, tree form
Japanese Tree Lilac	*Syringa reticulate*	'Ivory Silk'
Kousa Dogwood	*Cornus kousa chinensis*	
Shadowblow Serviceberry	*Amelanchier canadensis*	
Thornless Cockspur Hawthorn	*Crataegus crus-galli*	'Inermis' pink flowers, purple leaves
Washington Hawthorn	*Crataegus phanenopyrum*	only where thorns are not problematic
Winter King Hawthorn	*Crataegus viridis*	'Winter King'

TABLE 2 - RECOMMENDED CRABAPPLE CULTIVARS

Trees of the *Malus* (crabapple) species come in many beautiful shapes, sizes, and colors of leaf and flower, making it a popular, highly utilized specimen tree. Some crabapples, however, are plagued with disease, insects, and fruit litter problems. Diseases include scab, fireblight, apple-cedar rust, and powdery mildew. Researchers have bred new cultivars to resist these diseases and insects like the Japanese beetle. Maintenance requirements of crabapples can also be rather high. Often, recurring sprouts must be trimmed from the tree base. Because crabapples can grow quite wide and low, trees planted next to sidewalks, streets, and driveways need to be pruned for adequate clearance. Use of crabapple trees along the street should be reserved for tree lawns of sufficient size to accommodate the eventual width.

Many new cultivars are on the market annually. Purchase only disease-resistant varieties.

The following attractive cultivars, tested by Purdue University, have proven to have good disease and insect tolerance and few problems with fruit drop.

Cultivar	Height	Width	Comments
'Adirondack'	18'	10'	densely covered with white flowers
Baccata 'Jackii'	20'	20'	white flowers, glossy leaves
'Bechtel'	30'	15'	fragrant, large double pink flowers
'Centzam' (Centurion)	20'	15'	rose-red flower, reddish leaves
'David'	12'	12'	good looking year 'round, smaller
'Hargozam' (Harvest Gold)	25'	20'	white flowers, gold fruit
'Pink Spires'	15'	12'	pink flowers, purple leaves
'Prairiefire'	20'	20'	pink-red flowers, excellent tree
'Red Barron'	18'	8'	good for narrow spaces
'Red Jewel' (Jewelcole)	15'	12'	smaller tree, red persistent fruit
'Sinai Fire'	15'	15'	white flowers, weeping shape
'Van Eseltine'	25'	12'	upright vase shape
'Winter Gold'	25'	20'	winter-persistent gold fruit
X zumi 'Calocarpa' (Zumi)	20'	24'	white flower, red persistent fruit

CRABAPPLE CULTIVARS NOT RECOMMENDED

The following should not be used because of insect and disease susceptibility.

Cultivar	Cultivar	Cultivar
'Adams'	'Indian Summer'	'Selkirk'
'Baskatong'	'Liset'	'Sentinel'
'Brandywine'	'Madonna'	'Snowdrift'
'Candied Apple'	'Mary Potter'	'Sugar Tyme'
'Donald Wyman'	'Prairie Maid'	'Velvet Pillar'
'Doubloons'	'Profusion'	'White Cascade'
'Indian Magic'	'Robinson'	'White Candle'

TABLE 3 - MEDIUM TREE SPECIES FOR MEDIUM SPACES

Medium trees are defined as those trees attaining a height of 30 to 45 feet at maturity.

DISTANCE FROM INFRASTRUCTURE

- » Plant no closer than three feet from street, sidewalk, or curb.
- » Minimum grow space of five to six feet of tree lawn.
- » Do not plant under or within 10 lateral feet of any overhead utility lines.
- » Do not plant within five feet of any underground utility (phone, sewer, water, cable, electric).
- » Do not plant within 10 feet of any utility pole or fire hydrant.
- » Do not plant within three feet of a parking area unless vehicle wheel stops are provided.
- » Trees should not be planted where traffic line of sight is compromised at intersections.

MINIMUM SIZE

Trees planted in the public street tree lawn must be a minimum 1¾ inch diameter caliper (caliper is measured six inches above ground level).

Native tree species are indicated in bold.

Common Name	Scientific Name	Recommended Cultivars
American Hophornbeam	*Ostrya virginiana*	
Autumn Flame Red Maple	***Acer rubrum***	**'Autumn Flame'**
European Hornbeam	*Carpinus betulus*	'Fastigata'
Golden Raintree*	*Koelreuteria paniculata*	*should come from northern seed sources and nurseries; extreme cold may damage the tree
Hedge Maple	*Acer campestre*	
Katsura Tree	*Cercidiphyllum japonicum*	Plant only on sheltered sites, tree form
River Birch	*Betula nigra*	relatively short lived
Turkish Filbert	*Corylus colurna*	
Whitespire Birch	*Betula platyphlla japonica*	'Whitespire'
Yellowwood	***Cladrastis lutea***	

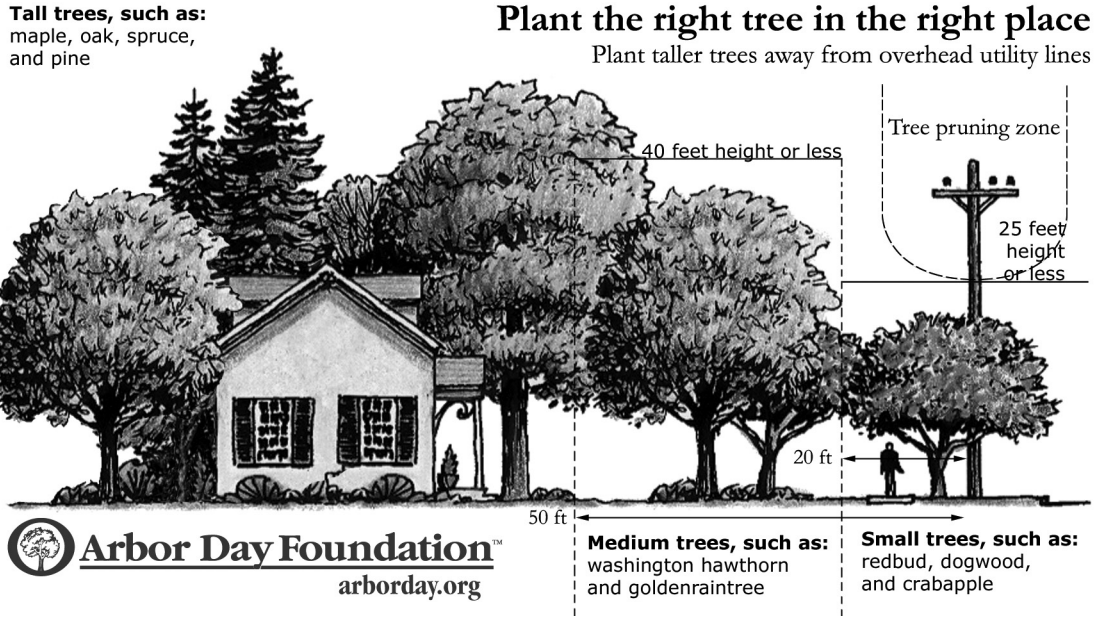


TABLE 4 - LARGE TREE SPECIES FOR LARGE SPACES

Large trees are defined as those trees attaining a height of 45 feet or more at maturity.

Large shade trees are recommended for planting wherever room allows, as they help increase Bloomington's overall tree canopy and provide numerous environmental benefits.

DISTANCE FROM INFRASTRUCTURE

- » Plant no closer than four feet from street, sidewalk, or curb.
- » Minimum grow space of eight feet of tree lawn.
- » Do not plant under or within 20 lateral feet of any overhead utility lines.
- » Do not plant within five feet of any underground utility pole or fire hydrant.
- » Do not plant within three feet of a parking area unless vehicle wheel stops are provided.
- » Trees should not be planted where traffic line-of-sight is compromised at intersections.

MINIMUM SIZE

Trees planted in the public street tree lawn must be a minimum 1¾ inch diameter caliper (caliper is measured six inches above ground level).

Native tree species are indicated in bold.

Common Name	Scientific Name	Recommended Cultivars
Bald Cypress	***Taxodium distichum***	
Basswood	***Tilia Americana***	**'Boulevard', 'Redmond'**
Blackgum/Tupelo	***Nyssa sylvatica***	
Black Maple	***Acer nigrum***	**'Greencolumn'**
Bur Oak	***Quercus macrocarpa***	**needs grow space of 12 feet or more**
Cucumber Magnolia	***Magnolia acuminate***	**only where thorns are not problematic**
English Oak	*Quercus robur*	susceptible to powdery mildew
Ginkgo	*Ginkgo biloba*	male clones only
Hackberry	***Celtis occidentalis***	
Homestead Elm	*Ulmus x*	'Homestead'
Kentucky Coffeetree	***Gymnocladus dioica***	**male clones only**
Littleleaf Linden	*Tilia cordata*	'Glenleven,' 'Greenspire'
London Planetree	*Platanus x acerfolia*	'Bloodgood'
Northern Red Oak	***Quercus rubra***	
Red Maple	***Acer rubrum***	**'Armstrong', 'October Glory', 'Red Sunset', 'Northwood', 'Bonfire', 'Commemoration'**
Shingle Oak	***Quercus imbricaria***	
Shumard Oak	***Quercus shumardii***	
Sugar Maple	***Acer saccharum***	**'Endowment', 'Green Mountain', 'Legacy' - do not plant too deep**
Swamp White Oak	***Quercus bicolor***	
Sweetgum	***Liquidambar styraciflua***	**'Moraine' - all have messy fruit**
Thornless Honeylocust	***Gleditsia triacanthos inermis***	**'Imperial', 'Shademaster', 'Skyline', 'Sunburst'**
White Oak	***Quercus alba***	
Zelkova	*Zelkova serrata*	'Green Vase'

TABLE 5 - UNDESIRABLE TREE SPECIES FOR STREET TREES

These trees shall not be planted along public streets. Undesirable characteristics are listed. Evergreens are acceptable on public sites only where visibility is not a problem.

» Fast-growing trees are weak-wooded trees and are susceptible to storm damage.
» Do not plant an unknown seedling, which is very likely an undesirable species.
» Avoid buying and planting cheap trees that have poor form or are partially dead.

Common Name	Scientific Name	Problems
American Elm	*Ulmus Americana*	disease prone
Amur maple	*Acer ginnala*	invasive seed
Arborvitae	*Thuja sp.*	visibility problems
Aspen	*Populus tremuloides*	weak wood
Ash, White and Green	*Fraxinus sp.*	Emerald ash borer prone
Black Locust	*Robinia pseudoacacia*	cankers, borers, breakage prone
Black Walnut, Butternut	*Juglans sp.*	messy fruit, alleotrophy
Boxelder	*Acer negundo*	weak wood, poor form, invasive seed
Catalpa	*Catalpa speciosa*	messy fruit
Common Cherry, Black Cherry	*Prunus sp.*	messy fruit, insect problems
Common Crabapple	*Malus sp. (unimproved)*	messy fruit, disease prone
Cottonwood	*Populus deltoides*	weak wood, messy seed
Fir	*Abies sp.*	visibility obstruction
Flowering Pear	*Pyrus calleryana*	invasive seed
Juniper	*Juniper sp.*	visibiity obstruction
Lombardy Poplar	*Populus sp. 'Lombardy'*	canker disease, weak wood
Mountain Ash	*Sorbus sp.*	thrives poorly here
Norway Maple	*Acer platanoides*	invasive seed
Osage Orange	*Maclura pomifera*	messy fruit
Persimmon	*Diospyros virginiana*	messy fruit
Pine	*Punus sp.*	visibility obstruction
Red, Slippery Elm	*Ulmus rubra*	disease problems
Russian Olive	*Elaeagnus angustifolia*	disease prone
Siberian Elm	*Ulmus pumila*	disease prone, weak wood, messy
Silver Maple	*Acer saccharinum*	weak wood, poor form
Spruce	*Picea sp.*	visibility obstruction
Tree of Heaven	*Ailanthus altissima*	invasive seed, weak wood
Tulip Poplar	*Liriodendron tulipifera*	weak wood
White Mulberry	*Morus alba*	messy fruit, somewhat invasive
White Paper Birch	*Betula papyrifera*	borer insects, short lived
Willow	*Salix sp.*	weak wood, invasive roots, messy

TABLE 6 - TREES TOLERANT OF URBAN CONDITIONS

The following tables give advice on trees that tolerate urban conditions and timetables for planting to get the best survival.

Urban sites often have poor soils and are exposed to stresses like pollution and road salt. These trees have proven to be most tolerant of such conditions and are good choices for tough sites.

Species	Species
Basswood	Hawthorns
Black Maple	Hedge Maple
Bur Oak	Honey Locust
Crabapple	Kentucky Coffeetree
Cucumber Magnolia	Littleleaf Linden
Ginkgo	London Planetree
Golden Raintree	Eastern Redbud
Hackberry	Shingle Oak

TABLE 7 - TREES SLOW TO RECOVER FROM TRANSPLANTING

Species	Species
American Hornbeam	Kentucky Coffeetree
Flowering Dogwood	Cucumber Magnolia
Ginkgo	Serviceberry
Hackberry	

Sources for More Information

Purdue Extension
Free advice on tree care, and insects and diseases of plants.
(812) 349-2575

Textbooks
Urban forestry-related material is located at the Monroe County Public Library.
(812) 349-3050
http://mcpl.info

The following reference books are good resources for tree care information:

Tree Maintenance by Pirone

Tree Care Handbook by Morton Arboretum

Web Sites

Arbor Day Foundation
www.arborday.org

Emerald Ash Borer
emeraldashborer.info

Indiana Urban Forest Council, Inc.
www.iufc.org

International Society of Arboriculture
www.isa-arbor.com

TABLE 8 - PLANTING SEASON BY SPECIES

Experience in tree planting has shown that certain trees have a higher survival rate when dug and balled and burlapped in the spring. The following two lists show the season that trees are normally dug at the nursery and out-planted. While containerized trees can be planted during most of the growing season, balled and burlapped trees should be planted when they are dormant (the leaves are off). This is usually Oct. 20 through May 1 in northern Indiana. Trees can be planted in winter as long as the ground is not frozen and the root ball is kept from freezing. Balled and burlapped trees can be planted while in leaf if extra care is taken to maintain constant root ball moisture and to protect the fragile leaves from drying out.

Spring Planting Only	
Bald Cypress	Hackberry
Black Gum/Tupelo	Hawthorns, all
Cucumber Magnolia	Kousa Dogwood
Flowering Cherry	London Planetree
Flowering Dogwood	Oaks, all (summer watering required)
Flowering Pear	Red Maple
Flowering Plus	Sweetgum
Golden Raintree	Zelkova

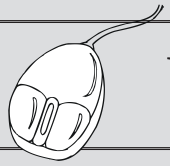
Spring or Fall Planting	
Basswood/Linden	Kentucky Coffeetree
Black Maple	Littleleaf Linden
Crabapples	Redbud
Ginkgo	River Birch
Hedge Maple	Serviceberry
Honey Locust	Sugar Maple
Japanese Tree Lilac	

TABLE 9 - TREES FAVORED BY JAPANESE BEETLES

The following trees may be defoliated in areas where Japanese beetles are numerous in July and August. Avoid these tree species if a local Japanese beetle problem exists.

Species	Species
Crabapple	Linden
Flowering Cherry	Littleleaf Linden
Flowering Plum	River Birch

Sources for More Information



Web Sites

Northern Trees-Tree Selection Guide
http://orb.at.ufl.edu/TREES

Indiana University Campus "The Woodland Campus" Walking Tour
https://spea.indiana.edu/doc/about/woodland.pdf

Tree Link
www.treelink.org

International Society of Arboriculture Tree Care
www.treesaregood.com

U.S. Forest Service, Northeastern Area Urban and Community Forestry
www.na.fs.fed.us/urban

City of Bloomington
Parks & Recreation
401 N. Morton St., Ste. 250

APPLICATION FOR TREE WORK PERMIT

Phone (812) 349-3716
Fax (812) 349-3705
E-mail hussl@bloomington.in.gov

Site (if address is unknown, fill in (A) and (B))

1. Address _____ ZIP Code _____

(A) N, S, E, or W side of _____ (B) _____ feet N, S, E, or W from intersection of _____

2. Subdivision _____ Lot Number _____

3. Applicant _____

Name Street Address

City State ZIP Phone E-mail

Contractor name and phone number _____

Plans by (name and phone number) _____

Proposed work: plant ● prune ● remove ● apply chemical ● work with 15 feet of ● otherwise affect (explain):

Number of trees affected _____ Size of each tree (DBH) _____

Width of tree lawn _____ Species of each tree _____

Circle all present within 15': overhead wires ● underground wires ● gas ● water ● fire plug ● sewer ● street light ● traffic sign/light

Explain exactly what you wish to do and why (attach additional plans if necessary):

***Work to begin:** _____ ***Work to end:** _____ ***Permit valid only during this period unless extended by Department.**

The applicant named above shall fully complete and sign this form. Unless otherwise approved by the Bloomington Parks and Recreation Department, this application must be submitted at least 7 days prior to date work is to begin. The permit is not valid until signed by the Department. Please keep a copy of the signed permit for your records. The applicant or his agent is solely responsible for providing notice as required by state law to all underground utilities before commencing an excavation.

By signing below I affirm that the information provided above is true. I agree to abide by any and all conditions imposed below. I agree to indemnify and hold harmless the City, the Board, and the officers, agents and employees of the City and the Board from any and all claims, demands, damages, costs, expenses or other liability arising out of the reckless or negligent act or omission or any willful misconduct on the part of the applicant or any contractors retained by the applicant for work under this permit. If I disagree with the denial of this permit or any conditions imposed, I may appeal in writing within 10 days to the Board of Park Commissioners.

Signed _____ Date _____

DO NOT WRITE BELOW

Date received: _____ Findings if different than information: _____

Conditions for approval or reasons for rejection:

☐ ANSI A300 - Standards for Pruning, Guying, Fertilizing, Spraying and Lightning Protection of Shade Trees

☐ ANSI Z133.1 - Safety Requirements for Tree Care and Removing Trees and Cutting Brush

☐ ANSI Z60.1 - American Standard for Nursery Stock

☐ Approved ☐ Rejected

Signature _____ Date _____

Bloomington Parks & Recreation Department

CITY OF BLOOMINGTON
parks and recreation
Urban Forestry

Application for Permit to Treat Trees on Public Land for Emerald Ash Borer

Bloomington Parks & Recreation Department
401 N. Morton St. Ste. 250 ● Bloomington, IN 47404
Urban Forester Lee Huss ● (812) 349-3716 ● hussl@bloomington.in.gov

The emerald ash borer (EAB) is an invasive beetle from Asia that attacks and kills North American ash trees. The EAB attacks only ash trees and will kill any ash tree not protected with insecticide. The City of Bloomington is responding to the presence of EAB by strategically removing ash trees, and by treating some select ash trees with chemical insecticide.

Residents may opt to pay for the chemical treatment of ash trees in the public right-of-way with an approved EAB insecticide to prevent EAB infestation and the removal of the tree. Applicants should understand chemical treatment of an ash tree for EAB is a financial commitment for the lifetime of the tree, with treatments required every two to three years. Residents who wish to initiate the chemical treatment of ash trees in the public right-of-way must submit this form to the Bloomington Parks and Recreation Department at least 7 days prior to the date the chemical treatment is to take place. Only ash trees that are in good health will be considered.

For more information about insecticides approved for use against EAB, or for help positively identifying ash trees, visit www.eabindiana.info.

Healthy ash trees along city streets that are being consistently treated by an approved tree care service for EAB remain the property of the City of Bloomington, but will not be removed by the City unless a condition or circumstance arises that necessitates the tree's removal. These conditions include, but are not limited to: structural damage to the tree (e.g. lightning strike, vehicle collision) that creates a safety hazard; interference with traffic line of sight, or infrastructure like fire hydrants and utility lines; or infestation by EAB despite efforts to chemically treat the tree. The final decision regarding the treatment or removal of any street tree lies with the city's urban forester.

Location of ash tree/s affected - If address is unknown, fill in (A) and (B)

1. Address: _____ ZIP Code: _____

(A) N, S, E, or W side of _____ (B) _____ feet N,S, E, or W from intersection of _____

2. Subdivision _____ Lot Number: _____

Applicant's Name:_____ Street Address: _____

City:_____ State: _____ ZIP: _____

Phone: _____ E-mail: _____

Who is doing the EAB treatment?

Name and phone number: _____

Number of ash tree/s affected:_____ Size (diameter in inches) of each affected tree:_____

Date treatment to occur: Between _____and _____(Permit valid only during this period unless extended by the Department.)

The applicant named above shall fully complete and sign this form. Unless otherwise approved by the Parks and Recreation Department, this application must be submitted at least seven days prior to the date treatment is to take place. The permit is not valid until signed by the Department. Please keep a copy of the signed permit for your records.

By signing below I affirm that the information provided above is true. I agree to abide by any and all conditions imposed below. I agree to indemnify and hold harmless the City, the Board, and the officers, agents and employees of the City and the Board from any and all claims, demands, damages, costs, expenses or other liability arising out of the reckless or negligent act or omission or any willful misconduct on the part of the applicant or any contractors retained by the applicant for work under this permit. If I disagree with the denial of this permit or any conditions imposed, I may appeal in writing within ten days to the Board of Park Commissioners.

Signed: _____ Date: _____

Do Not Write Below

Date Received: _____ Findings if different than information provided:_____

Conditions for approval or reasons for rejection:

☐ Approved ☐ Rejected

Signature:_____ Date:_____

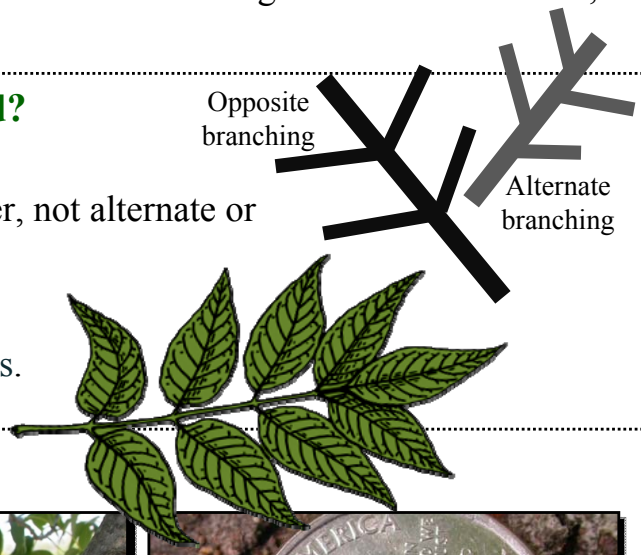
EAB for Homeowners: A Quick Guide

The emerald ash borer (EAB) is an **invasive beetle** from Asia that attacks and kills North American **ash trees** *(Fraxinus* spp). EAB attacks **only ash trees** and **will kill every ash tree not protected with insecticides.** The adult beetle is metallic green and about ½ inch long.

EAB came from Asia to Detroit in the early 1990s in shipping material made from ash wood. The insect was not identified in Michigan until 2002 after thousands of ash trees in the area had already died. Since then it has been spread to several states and parts of Canada, killing millions of ash trees. EAB is most commonly moved to new areas on **infested firewood**.

For **detailed information** on EAB and what homeowners can do to manage it on their ash trees, please visit: **www.eabindiana.info**

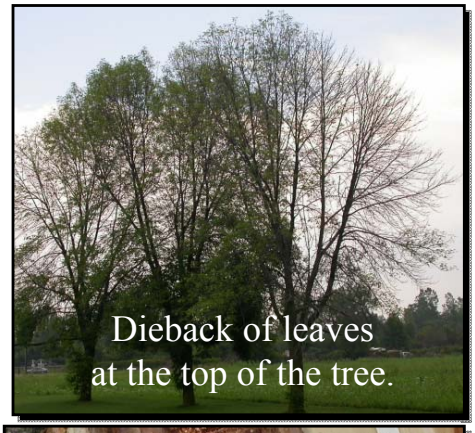
Do I have an ash tree in my yard or neighborhood?



Look for:

- **Branches and buds** that are **opposite** from each other, not alternate or staggered.
- **Compound leaves (**composed of leaflets instead of a single leaf). Each leaf is made up of 5-11 leaflets.

Is my ash tree infested with EAB? Look for:


Dieback of leaves at the top of the tree.


Vertical splits in the bark


Tiny D-shaped exit holes in the tree's bark.


Curvy S-shaped channels under the bark.


Epicormic shoots at the base of the tree.


Woodpecker damage on the bark ("flecking")

Arbor Day 2011
Indiana University Campus

Arbor Day 2012
Monroe County Public Library

ARBOR DAY
Trees... a joy forever

CITY OF BLOOMINGTON
parks and recreation
Urban Forestry

Arbor Day 2013
Bryan Park

Arbor Day 2014
East Seventh Street