NEBRASKA FOREST SERVICE

Immediate Care for Storm-Damaged Trees

Storm Damage Series #1

Trees damaged by storms require immediate attention (removing low-hanging branches, clearing from utility lines, etc.). Homeowners need to be aware of safety issues and consider the best approach for dealing with a tree they are trying to save. Chain saw work off the ground, removing branches that can't be reached from the ground and other heavy work (essentially all work on large trees), should be done only by professional arborists. (*See Storm Damage Series Bulletin #2, "How to Select an Arborist or Tree Service."*)

Hazardous Trees

Loose branches and split trunks are obvious safety concerns that should be dealt with as soon as possible to avoid injuring someone or damaging property if the branch or tree falls. Broken but firmly attached branches that pose no immediate danger can be pruned after the more hazardous branches have been removed. Trunks split down the middle are very difficult to brace adequately, and should be removed or treated by a professional arborist.

Power Lines

Branches hanging over power lines are a major safety hazard. Special training is required to prune branches over power lines. Homeowners should not attempt to prune these branches. Contact the local power company or an arborist trained in electrical line clearance to have them removed.

Leaning Trees

High winds and the heavy weight of snow or ice can tip a tree over and break the roots. Trees leaning from broken roots usually do not survive. If a tree tips in a storm, it often means the tree had damaged or poorly developed roots before the storm. Even if a tipped tree survives, it often is in danger of falling.

Mature trees rarely survive attempts to pull them back into place after being tipped over. They should be removed and replaced with new trees. Very young trees may survive if they are gently pulled back to a vertical position. To avoid additional damage to the remaining roots, press out air spaces that may have formed in the loosened soil; water the area of the root system twice weekly in the absence of rain during the fall, spring and summer; cover the root area with 2-4 inches of wood chip mulch; and stake the tree for the first year to prevent it from falling again. Do not tie rope, wire, wire-in garden hose or any narrow band of material around the tree during the growing season.

These will injure the trunk and

Randy Cyr, Bugwood.org

Jim Skiera, ISA, Bugwood.org

Top: After clearing downed trees, inspect remaining trees for loose or broken branches.
Above: Leaning trees usually have broken roots and rarely survive unless they are very young.

could kill the tree as it tries to grow. Use a broad strap or other fabric at least 1 inch wide, and inspect and adjust the location of the strap weekly during the growing season to minimize injury to the bark.

Remove Broken Branches

The only pruning that should be done immediately is removing broken branches. Leave the fine pruning and finishing cuts until after the tree has been thoroughly evaluated. Pruning cuts made during winter months will dry out to some degree. Dieback of the inner bark around a pruning cut can be minimized if the final pruning is done just before the tree begins to grow in the spring. Have a trained arborist make the finishing cuts.

Branches that have pulled away from the trunk should be removed at the bottom of the split. Avoid causing any additional damage to the trunk. Remove loose bark but do not cut into bark that is living and still attached.

Never "top" trees. The International Society of Arboriculture defines topping as the "indiscriminate cutting of tree branches to stubs or lateral branches that are not large enough to assume the terminal role." Topping creates serious hazards and dramatically shortens a tree's life. Other names for topping are "heading," "tipping," "hat-racking" and "rounding over."

Never use paint or wound dressing to cover wounds. These materials interfere with the tree's wound-sealing process.

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"Topping" trees inhibits their ability to produce food and makes them susceptible to insect damage and disease.

Do Not Fertilize

Do not assume trees damaged during storms will benefit from a fertilizer application. In most cases they will not, and the fertilizer will inhibit the tree's ability to recover.

Fertilizers can have negative effects on trees. For example, excess nitrogen in the soil will create a fast-growing, very green tree, but it will have a poorly developed root system and will be more susceptible to drought and problems from insects and diseases. Trees generally don't need more than 1 pound of actual nitrogen per 1,000 square feet of root area per year. If you fertilize the lawn under the tree, the tree gets plenty of fertilizer already. Apply additional fertilizer only if you know the tree has a nitrogen deficiency, which is determined by a soil analysis indicating nitrogen is present at a level below 10 pounds per acre.

If damaged trees are removed and new trees are planted, do not fertilize the new trees for the first three years. Newly tramsplanted trees need to regenerate the 90-95 percent of the root system they lost while being dug up. Applying nitrogen at planting time may only slow root regeneration.

Be Conservative

Don't prune or remove more of a tree than necessary. Remove hazards but postpone other decisions until later. Damage may look severe, but remember why you wanted the tree—it still may be able to serve that function. If you can delay the removal decision up to a year, you may decide the tree was not as badly damaged as you thought. After just a few years, the damage becomes much less noticeable.

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If possible, delay the decision on whether to remove a storm-damaged tree—you may see that the tree isn't as badly damaged as you thought. These trees in an Alma park were damaged in an ice storm the previous winter.

This series is based on a previous storm damage series researched and written by David Mooter.

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NEBRASKA FOREST SERVICE

How to Select an Arborist or Tree Service

Storm Damage Series #2

As storm cleanup progresses, Nebraska communities deal with the problem of removing and repairing severely damaged, surviving trees. In most cases, this work should be done by professional arborists.

Hiring an arborist deserves careful consideration. A qualified arborist will do tree work properly and safely. An unqualified person may damage the tree further and more importantly, may not be insured, leaving the liability burden to the client. This liability can run into tens of thousands of dollars.

Here are points to consider when hiring an arborist:

- **Check the phone directory's Yellow Pages or do an Internet search on "Tree Service" for a listing of businesses that do tree work in your area**. A listing in a directory indicates some degree of permanence. Also check company websites for association memberships, licenses held and insurance information.

Reputable arborists will not "top" a tree. It spurs growth of epicormic shoots and robs a tree of the ability to produce food.

- **Be cautious of any arborist who advertises "topping" as a service**. Topping, as defined by the International Society of Arboriculture, is the "indiscriminate cutting of branches to stubs or lateral branches that are not large enough to assume the terminal role." **Topping is not an approved tree maintenance practice**. Other names for it are "heading," "tipping," and "rounding over."

- **Ask for proof of certification by either the Nebraska Arborists Association or the International Society of Arboriculture**. Certification is not required by the State of Nebraska, but it indicates that the arborist has a high degree of knowledge.

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Chain saw work and removing branches that can't be reached from the ground should be done only by professional arborists.

- **If the arborist is not certified, determine if he or she is a member of any professional organizations, such as the Nebraska Arborists Association, the International Society of Arboriculture or the National Arborists Association**. Membership

in professional groups does not guarantee quality, but indicates professional commitment.

- **Ask for certificates of insurance, including proof of liability for personal and property damage and workers' compensation**. Contact the insurance company to make sure the policy is current. Under some circumstances, you can be held financially responsible if an uninsured worker is hurt on your property or damages a neighbor's property.

- **Ask for local references**. Take a look at some of the work and, if possible, talk with former clients. Experience, education and a good reputation are signs of a good arborist.

- **Don't rush into a decision just because you are promised a discount if you sign an agreement now**. Be sure you understand what work is to be done and the cost. It's generally not a good idea to pay in full until the work is finished.

- **Most reputable tree care companies have all the work they can handle without going door-to-door**. People who aren't competent arborists may solicit tree work after storms, seeing an opportunity to earn quick money. Storm damage creates high-risk situations for both workers and property. Legitimate arborists never ask for payment in advance.

Mark Adams, Bugwood.org

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Above: Reputable arborists carry insurance and use expensive, specialized equipment.

Below: Professional arborists won't use climbing spikes or improper bracing or pruning techniques, all of which will harm a tree.

- **If possible, get more than one estimate for the work to be done**.

- **A conscientious arborist will not use climbing spikes except when removing a tree**. They open unnecessary wounds that can lead to decay.

- **Good tree work is not inexpensive**. A good arborist must carry several kinds of insurance and pay for expensive, specialized equipment. Beware of estimates that fall well below the average. There may be hidden costs or the arborist may not be fully insured or trained.

This series is based on a previous storm damage series researched and written by David Mooter.

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NEBRASKA FOREST SERVICE

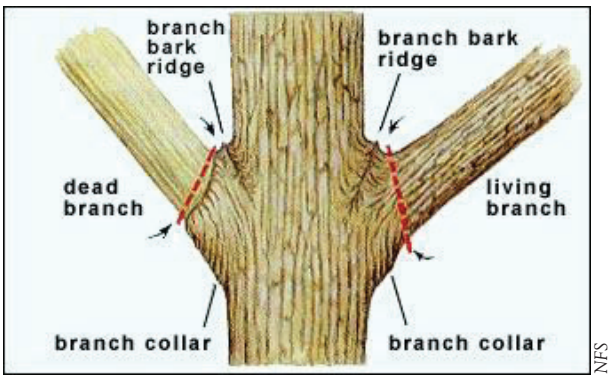
Pruning Storm-Damaged Trees

Storm Damage Series #3

The job of repairing trees that survive a severe storm and bringing them back to good health is critical. Before broken branches are removed, examine them carefully and use proper pruning methods to minimize damage from the pruning cuts. Branches that can't be reached from the ground, and essentially all work on large trees should be done only by professional arborists. (*See Storm Damage Bulletin #2, "How to Select an Arborist or Tree Service."*)

When to Prune

The only pruning that should be done immediately following a storm is removing broken branches. Leave the fine pruning and finishing cuts until later. All pruning cuts will dry out to some degree if made during the winter. Dieback of the inner bark around a pruning cut can be minimized if final pruning is left until just before the tree begins to grow in the spring.



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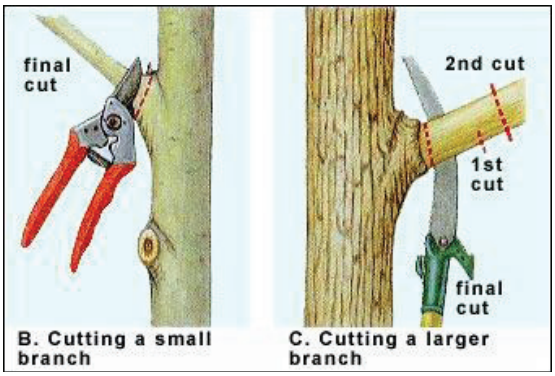

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Branches should be pruned using a series of three cuts: two to remove the weight of the branch (first under, then over the branch), then the final pruning cut.

Before pruning, locate the branch bark ridge, which is created when bark is pushed up as the branch grows.

USFS Northeastern Area Archive

Branches to Remove

Safety is the first consideration in removing branches from storm-damaged trees. Remove all loose branches as soon as possible to eliminate the potential for injury or damage if they fall. Next, remove cracked or broken branches. Branches that did not break under the weight of snow, ice or some other damage, but are bent, may have internal cracks or other hidden damage, especially if the branches have not returned to their upright position. These branches may become hazards in the future and should be considered for removal. A branch (or trunk) that was partially stripped of its bark when an attached branch pulled away should be removed if more than a third of the original circumference is lost. These branches are structurally weak and may become serious hazards if they are allowed to remain and gain weight.

Branches that have pulled away from the trunk should be removed at the bottom of the split. Avoid causing any additional damage to the trunk. Remove loose bark, but

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Peter Bedker, Bugwood.org

Left top, bottom and above: Flush cuts and cutting to stubs damage a tree and prevent it from sealing the pruning wound properly, which can result in decay and death of the tree.

Right, top and bottom: Proper pruning cuts are made outside the branch bark ridge and angle down and slightly away from the stem.

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do not cut into bark that is living and still attached.

Making Pruning Cuts

Pruning cuts should be made so that only branch wood is removed and the trunk or supporting stem is not injured. If only branch wood is removed, the wound is smaller, the tree will be able to seal the wound more effectively and the chance of problems with wood decay will be greatly reduced. To locate the proper place to make a pruning cut, look for the "branch bark ridge" on the upper surface of the union of the branch with the supporting stem. This is a line of bark that was pushed up as the branch and supporting stem grew. Some branch unions will not have this if they didn't form properly. Instead the branch will be pressing into the supporting stem, forming a sharp V-shaped union. At the base of the branch, and mostly underneath, look also for the "branch collar" which is a slightly swollen area of stem tissue that wraps around the base of the branch. A proper pruning cut begins just outside the branch bark ridge and angles down and slightly away from the stem, avoiding injury to the branch collar. Do not make flush cuts that remove the branch collar. Wounds created by flush cuts will cause substantially more injury to the tree than wounds left by proper pruning. Branches should be pruned using a series of three cuts: two to remove the weight of the branch (first under then over the branch), then the final pruning cut (*see diagram on front page*).

Pruning 'Don'ts'

Never "top" trees. Topping is the indiscriminate cutting of tree branches to stubs or lateral branches that are not large enough to assume the terminal role. Topping creates serious hazards and dramatically shortens a tree's life.

Never use paint or wound dressing to cover wounds. These materials do not help the tree and actually interfere with the tree's wound-sealing process.

For More Information

Nebraska Forest Service
http://nfs.unl.edu/treecare/pruning.asp
or
International Society of Arboriculture
treesaregood.com

This series is based on a previous storm damage series researched and written by David Mooter.

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NEBRASKA FOREST SERVICE

Large Tree Pruning & Care

Storm Damage Series #4

Storm damage to large trees can cause large problems. These problems can exist immediately after the storm or become evident many months or even years later. Since large trees involve large branches with significant weight, this kind of storm repair is best left to qualified professional arborists. (See *Storm Damage Bulletin #2, "How to Select an Arborist or Tree Service."*) Here are some things you can do to help larger trees recover from storm damage.

Trees with cracked or split trunks, water seepage or disturbed roots should be inspected by a professional arborist.

USFS, Bugwood.org

Inspect Trees

Inspect trees carefully following a storm, particularly if a tree has suffered previous storm damage. Look for splits and cracks in the trunk or major limbs. Note any areas where water appears to be seeping from within the tree. Inspect the root collar, which is the area where the roots join the trunk. Look for uplifted soil or disturbed roots. If any of these conditions exist, have the tree inspected by a qualified arborist.

Pruning

Pruning large trees should be left to a professional arborist. Working in larger trees can be dangerous due to the heavy weight of branches. Larger trees also may be located near or under utility transmission lines. Working around utility lines is dangerous. Special training is required for arborists to prune trees when a utility line is involved. If you suspect a tree needs pruning, contact a qualified professional arborist. If utility lines are involved, contact your local utility company immediately.

The top priority for pruning after a storm is to make the tree safe. (See *Storm Damage Bulletin #1, "Immediate Care for Storm-Damaged Trees."*) After this has been accomplished, evaluate the tree for reconstructive pruning needs. The goal is to maintain as many live branches in the crown of

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Top and above: Pruning large trees can be dangerous and requires special equipment and training, especially near utility lines.

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Left: Storm-damaged trees benefit from a 2-3 inch layer of wood chip mulch. Don't mound mulch around the base of the tree. "Volcano" mulch can lead to excess moisture around the roots.

the tree as possible so that sufficient leaf cover is maintained and the tree can return to normal vigor. At the same time it's important to remove severely damaged branches and minimize open wounds that will lead to decay. Severely damaged branches should be pruned back to a living parent branch using proper pruning cuts. (See *Storm Damage Bulletin #3, "Pruning Storm-Damaged Trees."*)

Mulching

Mulching is good for large and small trees. Spread mulch to a distance of at least 2-4 feet from the base of the tree. Wood or bark chips are the best mulch. Maintain a depth of 2-4 inches and do not pile up mulch against the tree trunk.

Don't Fertilize

Fertilization is not recommended for damaged or stressed trees. Using fertilizer can upset a tree's natural defense mechanisms and do more harm than good.

Removal

Determining whether a tree should be removed is a difficult decision for most homeowners. Major splits or cracks in the main trunk or in one or more major limbs may render the tree unsafe and require removal. In some cases, cable and brace work may be a viable option. Cabling and bracing should only be done by a qualified arborist. If done improperly, the tree will remain unsafe.

Consider the Tree's Function

If more than 50 percent of the tree's living crown has been destroyed, removing it may be recommended. Be aware, however, that if the tree's root system is intact, the crown will re-grow. Think carefully about the function the tree performs in the landscape. If this function (screening, shade, wind protection) is still being performed, you may want to try to salvage it.

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Some trees are damaged so severely that they must be removed for safety reasons. Others may be able to survive with special treatment if their root system is still intact.

Consult Professionals

Although removing a tree is a last resort, there are circumstances when it's necessary. An arborist can help decide whether a tree should be removed.

If you decide to have a tree removed, professionally trained arborists have the skills and equipment to remove it safely and efficiently. In all cases involving larger trees, homeowners should consult a professional arborist.

To obtain lists of certified arborists, contact:

Nebraska Arborists Association
521 First St., P.O. Box 10
Milford, NE 68405
402.761.2219
nearborists.org
or
International Society of Arboriculture
P.O. Box 3129
Champaign, IL 61826-3129
888.472.8733
isa-arbor.com

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NEBRASKA FOREST SERVICE

Don't 'Top' Trees

Storm Damage Series #5

Many trees damaged by severe storms have large broken branches. Properly repairing trees with this type of damage is often difficult and more time-consuming than the simpler job of "topping" the trees. Topping is very destructive and is not recommended. Here are some things to consider if a tree worker recommends topping a tree.

What Is Topping?

The International Society of Arboriculture defines topping as "the indiscriminate cutting of large branches back to long stubs." Topping cuts are made without regard to the location of side branches. Other names for topping include "heading," "tipping," "hat-racking," and "rounding over."

If Topping Is Recommended

The most appropriate response to a tree worker who recommends topping is to decline and look for another tree service. Topping is never recommended by anyone with a good understanding of trees.

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Above right: Topping a tree puts it under stress, causing it to develop weakly attached epicormic shoots that break easily. Large branch stubs left after topping rarely form sealing callus tissue, leaving the tree wound open to decay and attack by insects and disease.

Why Topping Is Harmful

- Topping removes a major portion of a tree's leaves, which are needed to produce food. This damaging practice can begin an irreversible decline in the tree.
- Topping makes a tree more susceptible to insects and diseases by reducing its ability to produce chemical defenses.
- Branches left after topping become decayed and may cause serious injury or property damage if they break.
- Cuts made by topping stimulate the development of many epicormic shoots (water sprouts) just below the cut, which are easily broken off in storms.
- Topping destroys a tree's natural form and wastes money.

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NEBRASKA FOREST SERVICE

Recognizing & Correcting Tree Hazards

Storm Damage Series #6

Trees should be inspected for defects and hazardous conditions after a severe storm. Some trees are in danger of falling and have high immediate potential for serious injury or property damage. Others may have a lower immediate potential risk, but the long-term risk of significant injury or damage may still be too great to allow the questionable branch or tree to remain.

Hazards in trees need to be eliminated either by removing the tree or the affected branches or by some kind of corrective treatment. Following are descriptions of hazards common in storm-damaged trees and what can be done about them.

Electrical Hazards

Branches hanging over power lines are a major safety hazard. Special training is required by law to prune branches over power lines safely. Homeowners with tree branches that rub or may break power lines should contact the local power company or arborist trained in power line clearance to have the branches removed.

Structural Hazards

Trees and branches are hazards if they have a strong potential to fall and cause injury or property damage. In many cases, the only practical solution is to remove the damaged branch or tree. Cabling and bracing are sometimes used to strengthen high-value trees, but these techniques are not routinely recommended and should be done only by trained, certified arborists.

Following a severe storm, homeowners should check trees for several kinds of hazardous defects:

- **Loose or broken branches**. These should be removed before they fall.

Left and middle: Inspect damaged trees for broken branches following a storm. Most trees with split trunks will not recover and need to be removed by a certified arborist.
Right: Trees near power lines should be treated only by power company employees or trained arborists.

Jim Skiera, Bugwood.org

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USFS, Bugwood.org

Left: A leaning tree indicates serious root failure. Trees leaning after a storm should be removed.

Right: Topped trees often develop small epicormic shoots on decaying branches that likely will fail in a later storm.

Joseph O'Brien, USFS, Bugwood.org

- **Split trunks**. Trees with split trunks likely will fail completely in a later storm. They should be removed, or they can be cabled and braced if they have especially high value.

- **Trunks or branches with more than a third of their circumference lost**. This occurs on the trunk or a large branch where a branch was pulled out. The tree has a high risk for breaking and this kind of damage cannot be repaired adequately. The tree or branch should be removed.

- **Leaning trees**. A tree that is leaning after a storm has major root failure. Even a slight lean with a small area of raised soil at the base can mean significant potential for additional failure. Trees leaning due to a storm should be removed.

What Not to Do

- **Do not attempt any pruning that cannot be done from the ground**. For safety reasons, large trees should be pruned only by certified arborists.

- **Do not try to support a damaged tree with rope, cable, wire, bolts or other materials**. The effort likely will not increase the tree's safety. If cabling and bracing are necessary, they should be done by a certified arborist.

Below: Cabling sometimes is used to try to save a valuable tree, but it should be done only by a trained arborist. Using improper materials and technique (bottom photo) can damage a tree.

Joseph O'Brien, USFS, Bugwood.org

Joseph O'Brien, USFS, Bugwood.org

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- **Do not try to save a tree that was pushed over by a storm unless it was recently planted**. The tree's roots will likely never develop enough to support the tree adequately.

- **Do not top trees**. Topping is the indiscriminate cutting of large branches back to long stubs. Cuts are made without regard to the location of side branches, and over the years the tree will become even more of a hazard.

- **Do not use paint or wound dressing to cover wounds**. These interfere with the tree's natural wound-sealing process.

- **Do not fertilize damaged trees**. Nitrogen can make a stressed tree even more susceptible to insects and diseases and reduce its ability to deal with the damage.

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NEBRASKA FOREST SERVICE

Tree Selection & Placement

Storm Damage Series #7

Lessons are learned when storms strike. One lesson is where to place trees properly in the landscape. Damage to life and property can be minimized if mature tree size is considered when selecting a tree.

Successful tree and shrub planting requires knowing growth characteristics, site requirements and intended landscape function of each species. Landscape trees and shrubs are not difficult to plant, but selecting a suitable species and using proper planting techniques are necessary to ensure success.

Planting Locations

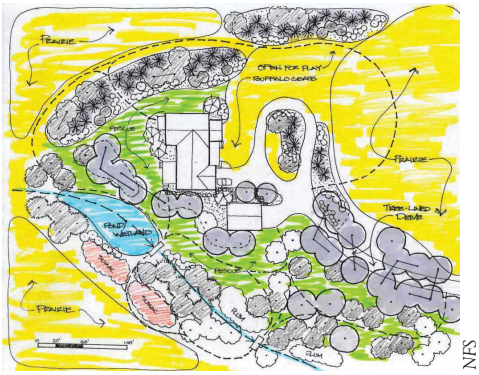
Selecting a planting location is a critical decision. Too often trees are removed because they have grown too large for the site. Specific items to consider are overhead and underground utilities, future construction sites and the mature size of the tree.

Plant large landscape trees at least 20 feet from buildings or other obstructions and 25 feet from overhead power lines. Plant shrubs at least 5 feet from any potential conflicts. These are minimum requirements and greater distances are preferable in most cases.

When choosing a planting site, also consider the tree's requirements to grow and survive, such as exposure to sunlight and soil drainage.

Conflicts with Utilities

When deciding which type of tree to plant, remember to look up and look down to determine where the tree will be located in relation to overhead and underground utility lines. Overhead lines may be for electricity, telephone or cable television. Underground lines include those mentioned previously plus water, sewer and natural gas. The location of these lines should have a direct impact on the tree and planting site selection.



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A landscape designer will help select trees, shrubs and plants that meet your needs and are appropriate for the available space.

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Plant large landscape trees at least 20 feet from buildings and 25 feet from overhead power lines. The location of underground utilities is another key consideration when selecting a planting site.

Most communities offer n a free "one call" service to locate underground lines. In most cases this is required by city or state law. Never assume that utility lines are buried deeper than you plan to dig. In some cases they are very close to the surface.

The ultimate mature height of a tree to be planted must be within the available overhead growing space. Just as important, the soil area must

be large enough to accommodate the tree's roots and eventual trunk diameter. Proper tree and site selection will provide trouble-free beauty and pleasure for years to come.

Design

Landscape design is a matter of personal taste. Many full-service nurseries offer professional landscape design as part of their tree-planting services. There also are certified landscape architects who can help you design a landscape to fit your needs.

Things to Consider

Here are some things to keep in mind when selecting and planting trees:

- **Consider your neighbors' view and their existing plantings**. Try not to be in conflict.
- **Plant large trees at least 20 feet from a building** to allow proper root development and to minimize potential damage to the building.
- **Use smaller trees to frame your home**. Also consider shrubs—they will add beauty and shade to your landscape.
- **Contact local municipal offices when planting in the public right-of-way**. Some cities require a permit to plant in this area. This allows better control over the types and sizes of trees that are planted.
- **Plant smaller trees where growing space is limited**. This is particularly true in older sections of towns with smaller lot sizes. Smaller trees can provide useable shade.
- **Use evergreens for wind protection on the west or north sides of the house**. Don't plant trees too close to the house. Remember that evergreens provide shade all year. Shading a driveway with evergreens will prevent sunlight from penetrating in the winter to help melt snow and ice.
- **Plant deciduous (autumn leaf-dropping) trees on the south or west sides of your home** to help cool it in the summer and warm it in the winter.

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Small trees and shrubs can be used to frame the home and provide shade and added interest to the landscape.

Plan Carefully

Careful planning prior to planting will help ensure that the right tree is planted in the right place. Proper tree selection and placement will enhance your property value and prevent costly maintenance trimming and damage to your home.

Good landscaping utilizes shrubs and low-growing trees that are compatible with utility lines so they will not create public safety hazards, cause service interruptions or require severe pruning.

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Tree Planting

Storm Damage Series #8

Tree losses from severe storms can be heavy, and homeowners often lose large trees or trees that have sentimental value. These kinds of trees cannot be replaced. But new properly planted and maintained trees and shrubs add beauty, protection, diversity and value to almost any property. Trees and shrubs provide these benefits whether they are planted in a park, in front of your house or along a street or highway.

Successful tree and shrub planting requires knowing growth characteristics, site requirements and intended landscape function of each selected species. Landscape trees and shrubs are not difficult to plant, but proper species selection and planting techniques are necessary to ensure success.

Proper Selection is Key

Here are some tips to help you select and plant trees in your yard:

- Consider your location and watch for overhead and underground utilities. Remember that small trees grow into big trees.

- Foresters, arborists and nursery professionals are a good source of technical information when selecting and planting trees.

- It's best to choose plants that have been grown within your hardiness zone. Plants with seed sources grown in southern areas may find it difficult, if not impossible, to adjust to Nebraska's climate. In general, nursery suppliers north of Interstate 70 provide the best stock for Nebraska's climate. Ask your nursery professional where the stock originated.

- While planting larger trees may create an immediate impact, smaller trees (2 inches or less in diameter) will recover from transplant shock more quickly and typically will catch up and outgrow the larger tree due to increased vigor.

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Planting Tips

- Locate all underground utilities before digging.

- Dig the planting hole substantially wider than the root system of the tree or shrub to be planted. The finished hole should be narrower at the bottom than at the top and be at least 2 feet wider than the root mass.

- During planting, place the root ball on solid soil at a depth where the root flare is at, or slightly higher, than the original grade.

Top: Smaller trees will recover from transplant shock quicker than larger trees.

Middle: Dig the planting hole 2 feet wider than the root ball; place the root ball on solid soil.

Bottom: Remove all materials surrounding the root ball before planting.

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Clockwise from top left: If roots are wrapped around the root ball, gently loosen them by hand and spread out as much as possible. Staking stabilizes the root ball in the soil.

- Do not use soil amendments such as compost, bagged garden soil, peat moss or fertilizer.

- After the plant is set at the proper level in the hole and sufficient backfill is placed in the hole to prevent any movement of the ball, cut and remove from the tree and planting hole all twine, burlap and basket wire or cage.

If the plant is in a wire basket, cut the wire and remove it where possible, as long as damage to the root ball can be prevented, and remove the burlap. Containers (even peat pots) should be completely removed before planting.

If girdling roots (roots visibly wrapped around the root ball) are present, loosen them by hand and spread out as much as possible or cut with pruning shears. Add backfill soil in layers and use water to help settle the soil. Be careful not to tamp or work the soil after the plant has been watered or the soil will become too compacted.

- Prune trees at planting time only to remove branches damaged during handling and transplanting. Do not prune the main leader on single-stemmed trees unless it has been damaged. Do not remove lower branches completely because they manufacture critically needed food and help protect the lower trunk.

- Staking is recommended for most tree plantings. Staking and guying stems are designed to stabilize the root ball in the soil, not to secure the trunk and keep it from moving. Staking systems should be monitored throughout the growing season, adjusted as necessary to prevent trunk girdling. They usually are removed after one growing season.

- Do not wrap tree trunks.

- Water two or three times a week to keep soil moist but not saturated. Sprinkler systems that run daily will kill trees.

- Mulch with a 2- to 4-inch layer of wood chips or other organic material. Do not use grass clippings. Mulching conserves moisture, reduces weed competition and insulates roots from temperature extremes.

- Do not fertilize trees for three years after planting. After that, normal turf fertilization should be sufficient.

This series is based on a previous storm damage series researched and written by David Mooter.

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A 2- to 4-inch layer of wood-chip mulch is optimal for newly planted trees. Don't mound mulch around the base of the tree.

Additional Information

More information about tree planting and care can be found at the Nebraska Forest Service website at nfs.unl.edu or from the Nebraska Statewide Arboretum at arboretum.unl.edu

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NEBRASKA FOREST SERVICE

Care of Newly Planted Trees

Storm Damage Series #9

Many recommended practices for newly planted trees have changed in recent years. Here are some tips that will give newly planted trees a better chance to survive and thrive.

Mulch Properly

Mulching is the most important post-planting practice you can do to improve the health and vitality of your landscape tree. Wood-chip mulch can nearly double growth in the first few years by protecting tree roots from extreme weather, preserving soil moisture, eliminating grass and weed competition and preventing damage from mowers and weed trimmers. Apply a layer of wood-chip mulch 2-4 inches thick to a diameter of 3-4 feet. Don't mound mulch around the base of the tree.

Prune Sparingly

Prune trees and shrubs at planting time only to remove branches damaged during handling and transplanting. Lower branches manufacture critically needed food and should not be removed. Inspect plants after a year and remove dead and crossing branches. Trees do not need to be pruned to balance the root with the top.

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Newly planted trees need water, but be careful not to overwater them. They need no more than an inch of surface water each week.

Don't Overwater

Water is critical to the success of any tree or shrub planting. However, overwatering is a major cause of tree failure in many Nebraska communities. Heavy clay soil can severely restrict the natural percolation of water. Newly planted trees should receive no more than an inch of water a week during the growing season. Don't water more than two or three times a week. Running automatic irrigation systems 20-30 minutes daily will severely damage the root system and can kill a tree.

Left: Newly planted trees benefit from a 2-4 inch layer of wood-chip mulch. The mulched area should be 3-4 feet in diameter or to the edge of the tree's branches, called the drip line. If there are several trees in an area, creating a mulch island is an effective and attractive option to protect them from being injured by yard maintenance equipment.

Wrapping Isn't Recommended

For many years it was recommended that tree trunks be wrapped to protect them from sun scald or freeze injury, rodents, mowers, weed trimmers and other assorted problems. However, research has shown that tree wraps may not always protect trunks from damage and, in fact, can cause, hide and increase problems. The problems associated with tree wraps can be very damaging, so routine use of wraps is not recommended.

Wrap a tree trunk only if a nursery guarantee requires it, if the tree species is susceptible to winter sun scald damage on the trunk, or during the time that the tree is being transported and needs protection from mechanical damage.

If wrapping is used, keep it on the tree only during the first winter, then remove it completely the following spring. Any wrap left on the tree during the growing season may girdle the tree as the trunk grows in diameter.

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Use a Trunk Guard

Damage from rodents, mowers and weed trimmers can be prevented by using plastic guards. A simple, yet effective, guard can be made using perforated drain tile cut in 12-inch sections and split down the side so it can be placed around the tree trunk. Monitor plastic guards regularly and remove them before rubbing or girdling problems occur.

Staking & Guying

Staking and guying systems are used to stabilize the root ball of a newly planted tree. Materials should be strong enough to provide support, but flexible enough to allow some movement. Guying materials should have a broad surface at the point of contact with the tree to prevent damage from rubbing. Plastic horticultural tape or canvas webbing that's at least 1-1/2 inches wide make good guying materials. Monitor the tree throughout the growing season and adjust the materials if necessary to prevent trunk girdling. The materials typically are removed at the end of the first growing season. Any trees that do not establish within a year will likely never establish a strong root system.

Don't Fertilize

Fertilizers are generally not recommended at planting time since most Nebraska soils contain sufficient levels of nutrients for newly planted landscape trees. Once trees are established, determine their nutrient needs based on their condition and a soil analysis.

This series is based on a previous storm damage series researched and written by David Mooter.

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Left: A mesh guard will protect the tree trunk from damage from animals and mowing or weeding equipment. It is preferred to a trunk wrap, which may hide problems or make them worse.

Right, top: Staking sometimes is required to stabilize newly planted trees. Materials touching the trunk should have a broad, smooth surface and be flexible enough to allow some movement.

Right, middle and bottom: Serious damage, such as these girdled trunks, can occur if stabilizing materials are not removed after the first year.

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NEBRASKA FOREST SERVICE

Storm Damage Resources

Storm Damage Series #10

Many resources are available for communities and individuals looking for more information about storm damage to trees and landscapes. These resources range from government publications to forestry and arboricultural organizations to websites.

Publications

Nebraska Forest Service
Storm Damage Series
nfs.unl.edu

Organizations

Nebraska Forest Service
nfs.unl.edu
402.472.2944

Nebraska Arborists Association
nearborists.org
402.761.2219

Nebraska Nursery & Landscape Association
nnla.org
402.761.2216

Nebraska Statewide Arboretum
arboretum.unl.edu
402.472.2971

University of Georgia
School of Forestry and Natural Resources
www.forestry.uga.edu
706.542.2686

Alliance for Community Trees
actrees.org
301.277.0040

Tree Care Industry Association
tcia.org
800.733.2622

International Society of Arboriculture
isa-arbor.com
treesaregood.com
217.355.9411

Arbor Day Foundation
arborday.org
888.448.7337

American Forests
americanforests.org
202.737.1944

The USDA Forest Service
www.fs.fed.us
800.832.1355

This series is based on a previous storm damage series researched and written by David Mooter.