



5. Resist the urge to overprune.

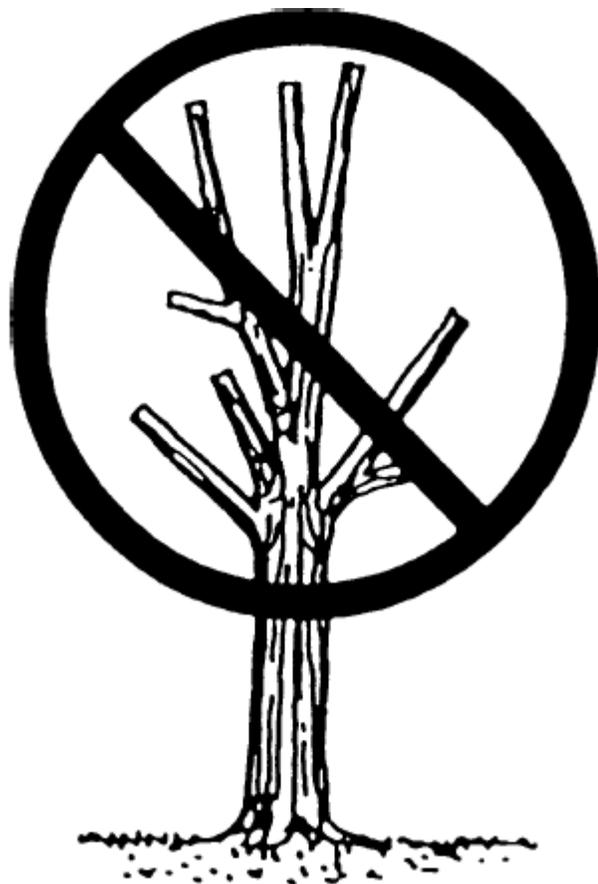
Don't worry if the tree's appearance isn't perfect. With branches gone, your trees may look unbalanced or naked. You'll be surprised at how fast they will heal, grow new foliage and return to their natural beauty.

6. Don't top your trees.

So-called "tree experts" may urge you to cut back all of the branches, on the mistaken assumption that reducing the length of branches will help avoid breakage in future storms. This practice is called "*Topping*" and it is one of the worst things you can do to your tree. Stubs will tend to grow back a lot of weakly- attached branches that are even more likely to break when a storm strikes. Topping the tree will reduce the amount of foliage, on which the tree depends for the food and nourishment needed for re-growth.

Topped trees are more likely to die than repair itself. At best, its recovery will be retarded and will almost never regain its original shape or beauty.

Hopefully following these six steps will protect you and your trees after a storm strikes.



Never cut the main branches of a tree back to stubs. Ugly, weakly attached limbs will often grow back higher than the original branches and be more likely to break off in a failure.

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Hurricanes & Trees

Basic Tree Care After a Storm

The first impulse of the homeowner after a major storm is to hurry up and clean up the mess. Making hasty, decisions may result in removing trees that could have been saved.

Doing what's right in the first few days after trees have been damaged can make the difference between saving your tree or losing your tree unnecessarily.

Here are a few simple rules to follow for tree care after a storm:

1. Don't try to do it all yourself. If large limbs are broken or hanging, or if high climbing or overhead chainsaw work is needed, let a professional arborist do it.

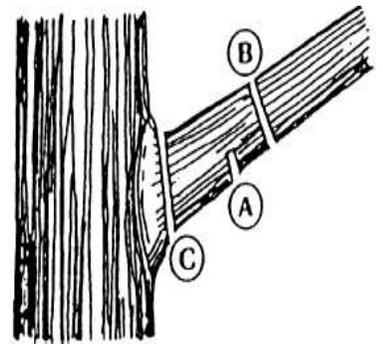
2. Take safety precautions. Look up and down the tree. Be alert for downed power lines and dangerous hanging branches. Stay away from any downed utility lines – low voltage telephone or cable lines and even fence wires can become electrically charged when there are fallen or broken electrical lines nearby.

3. Remove any broken branches still attached to the tree.

Removing the jagged remains of broken limbs is the most common repair that property owners can make after a storm. If done properly, it will minimize the risk of decay entering the wound. Smaller branches should be pruned at the point where they join larger ones. Large branches that are broken should be cut back to the trunk or a main limb.

FOLLOW THE PRUNING GUIDELINES.

Because of its weight a large branch can tear loose during pruning, stripping the bark and creating jagged edges that invite insects and disease. That won't happen if you follow these steps:

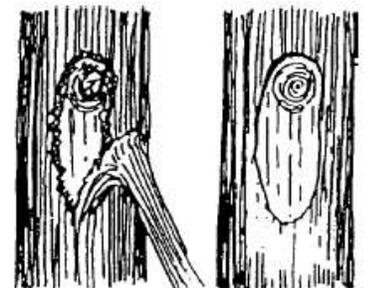


- A.** Make a partial cut from beneath, at a point several inches away from the trunk.
- B.** Make a second cut from above several inches out from the first cut, to allow the limb to fall safely.
- C.** Complete the job with a final cut just outside the branch collar, the raised area that surrounds the branch where it joins the trunk.

4. Repair Torn Bark. To improve the tree's appearance and eliminate hiding places for insects, carefully use a chisel or sharp knife to smooth the ragged edges of wounds where bark has been torn away.

*Try not to expose any more of the cambium (greenish inner bark) than is necessary, as these fragile layers contain the tree's food and water lifelines between roots and leaves.

Smoothing the ragged edge of torn bark helps the wound heal faster and eliminates hiding places for insects.





1. It's a keeper

If damage is relatively slight, prune any broken branches, repair torn bark or rough edges around wounds.



An Easy Call

A mature, healthy shade tree will survive the loss of one major limb. The broken branch should be removed properly.

Minor Damage

Although the tree has been damaged, enough strong limbs may remain on a basically healthy tree to make saving it possible.



Too Young to Die

Young trees can sustain quite a bit of damage and still mend quickly. If the leader is intact and the structure for future branching remains, remove the broken branches and let the tree repair itself.



2. Wait and See

If a valuable tree appears to be a borderline case, resist the temptation to simply cut the tree down and be done with it. In such cases, it may be best to stand back for a while and think it over.



Easy Does It

Resist temptation to prune too heavily. Remember that the tree will need all of the foliage it can produce in order to make it through the next growing season. Remove only the damaged limbs, wait and see what happens.

Hold Off

A healthy mature tree can recover even when several major limbs are damaged. With large trees, a professional arborist should be

contacted to assess damage on a borderline situation, and to safely accomplish needed pruning and branch removal.



3. Say Goodbye

Some trees simply can't be saved or are not worth saving. If the tree has already been weakened by disease, if the trunk is split, or more than 50 percent of the crown is gone, the tree has lost its survival edge.

Tree Tragedy

This otherwise healthy young tree has lost its crown –the leafy head that is vital for its survival. It will not be able to grow enough new branches and leaves to provide needed nourishment, and will never be able to regain its former beautiful shape.



Hopeless Case

About all that's left of this tree is its trunk. The few remaining branches can't provide enough foliage to enable the tree to make it through another growing season



Say It's Over

A rotten inner core in the trunk or structural weakness in branching patterns can cause a split trunk – the tree equivalent of a heart attack. The wounds are too large to ever mend, and the tree has lost its sap lifeline between roots and leaves. The tree is all but dead.



Ask for Advice

Seek help from a tree professional and hire a licensed arborist if tree work is needed.



Hurricanes & Trees

Can These Trees Be Saved?

A storm can leave trees looking like there's no tomorrow. Major limbs may be broken or damaged, foliage can be shredded or stripped, or the bark may be torn or gouged. But what at first glance may look like mortal wounds are not necessarily fatal to a tree. Trees have an amazing ability to recover from storm damage.

FIRST ASSESS THE DAMAGE

Before writing off a damaged tree as a "goner", homeowners should evaluate their trees by asking the following questions:

Other than the storm damage, is the tree basically healthy and vigorous? If the tree is basically healthy, is not creating a hazard, and did not suffer major structural damage, it will generally recover if first aid measures are applied immediately after the storm.

Are major limbs broken? The larger a broken limb is, the harder it will be for the tree to repair the damage. If the majority of the main branches are gone, the tree may have little chance of surviving.

Has the leader, (main upward – trending branch on most trees) been lost? In species where a leader is important to upward growth or desirable appearance, it may have to be a judgement call. The tree may live without its leaders, but at best would be a stunted or deformed version of the original.



Is at least 50 percent of the tree's crown (branches and leaves) still intact? This is a good rule of thumb on tree survivability. A tree with less than half of its branches remaining may not be able to produce enough foliage to nourish the tree through another season.

How big are the wounds where branches have been broken or bark has been damaged? The larger the wound is in relation to the size of the limb, the less likely it is to heal, leaving the tree vulnerable to disease and pests. A two-to-three inch wound on a 12-inch diameter limb will seal over with new bark within a couple of years.

Are there remaining branches that can form a new branch structure? The remaining limbs will grow more vigorously as the tree tries to replace its missing foliage. Look to see if branches are in place that can eventually fill out the tree's appearance.

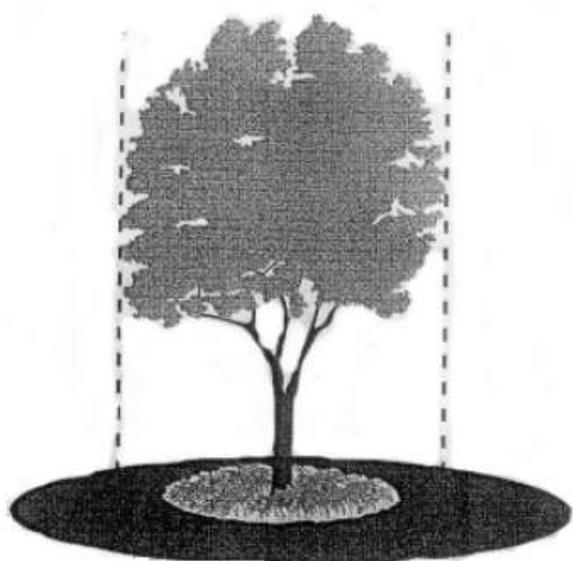
Is the tree of a desirable species for its location? If the tree is in the wrong location (such as a potentially tall tree beneath a power line) or an undesirable species for the property (messy fruit, etc.) it may be best to remove it if it has serious damage.

NOW, MAKE THE DECISION

The questions listed above will help you make informed decisions about your trees. In general, the answer will fall into one of three categories:



- 5. Do not overfertilize the tree with nitrogen or overwater the soil.** These practices can increase crown surface area and/or decrease the rooting area. It is a good practice to mulch around trees with a 3-4 inch mulch layer properly laid out.



Apply fertilizer evenly on the mulched and unmulched surfaces out to about 1.5 – 2 times the canopy diameter.

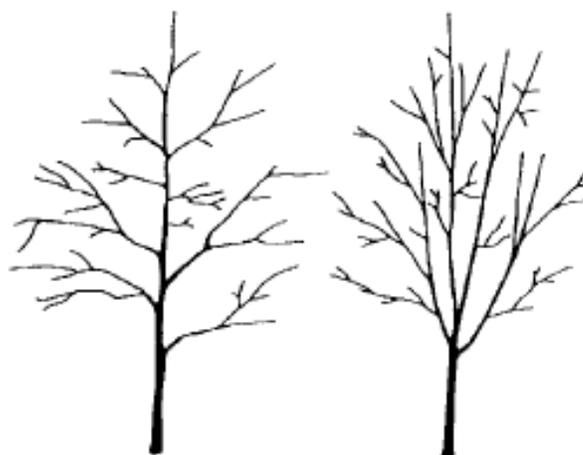
- 6. Eliminate lopsided crowns.** Prune branches to produce a reasonably symmetrical crown. If more than **70 percent** of the crown is on one side of a mature tree, consider tree removal and replacement. Guying and bracing branches are **last-ditch efforts** when a tree has to be saved in spite of itself.

- 7. Remove or treat pest problems like insects, diseases and branch cankers to minimize potential damage.**



- 8. Keep the tree growing upright with one main stem.**

Prune away branches that compete in height with the main stem. Eliminate branches with **tight** or **narrow** crotches. These are potential **weak** spots.



A Good Quality
Shade trees should be trained to one central trunk, and branches should be spaced along the trunk.

B Poor Quality
Large-sized trees (such as oaks) with several trunks or those with branches clustered together on the trunk can become hazardous when they grow older.

- 9. Install lightning protection systems on historic or rare specimen trees.**

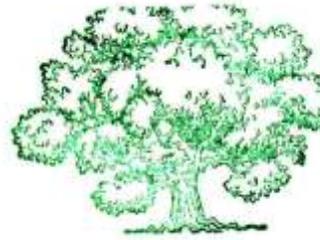
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Hurricanes & Trees

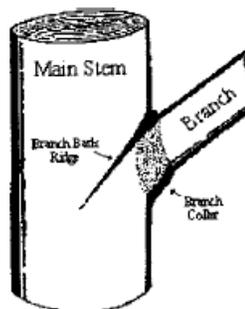
Helpful Steps to Minimize Storm Damage to Trees

There is no way, except for complete enclosure, to protect trees from storm damage. Trees are not adapted to worst-case storms but only to our average wind climate. Following are several things to minimize the main types of storm damage.

1. Let trees adjust to the wind environment. It has always been thought that newly planted trees had to be tightly staked and guyed in place. Research has shown that this practice **prevents** the tree from naturally adapting to wind loading. If trees need to be staked, stake and tie the tree loosely where the stem can move and bend in the wind. Continue to loosen the ties so no girdling will take place. The tree will continue to grow and adjust to its new environment.

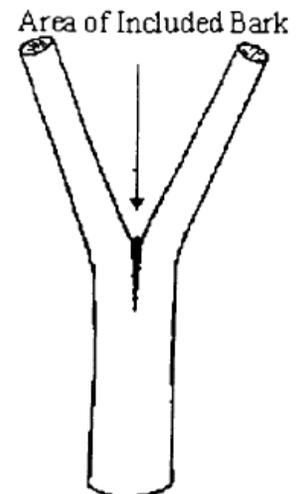
2. Practice proper pruning techniques. Branches should be cut before they become larger than **one-inch** in diameter on **young trees**. The branch collar should **not** be damaged when pruning.

(Figure 1)
Prune and thin trees to give them a lower center of gravity and to lessen leaf mass.



3. Eliminate Co-dominant branches. Co-dominant branches have an area of included bark which is subject to split and cracks. Prune forked branches and branches that arise opposite each other on the stem **early** in the tree's life. Cut one side off early to prevent losing the whole tree later if it splits in a storm.

In trees with opposite branching patterns, such as ash or maple, proper branch training is essential for a long-lived, storm resistant tree.



4. Keep trees as healthy as possible. Timely watering and proper fertilization are essential for tree health in the urban setting. Healthy vigorous trees adjust more quickly to changes in the environment, are more wind firm, and react more effectively to damage.



OTHER GOOD WIND RESISTANT TREE SPECIES

American Elm
American Holly
American Hop Hornbean
Black Locust
Catalpa Tree
Cherrybark Oak
Cherry Laurel
Crape Myrtle
Dahoon Holly
Green Ash
Hackberry
Nuttall Oak
Osage Orange
Pond Cypress
River Birch
Sabal Palm
Savannah Holly
Southern Magnolia
Sycamore
Sweet Bay Magnolia
Sweet Gum
Tulip Tree
Willow Oak

“VICTIM” OR WEAK WOOD TREES

These trees are generally fast growing, shallow rooted in heavy clay or wet soils and either snap or up root in storms.

Pecans
Pines
Some Red Oaks
Red Cedars
Ornamental Pears
Willows
Silver Maples
Box Edlers
Cottonwoods
Hickories
Some Elms

Mature water oaks were severely damaged from Andrew’s path. They are trees that had short, shallow roots. It is a classic example of fast-growing, weak wooded trees that have a shallow-root system growing in heavy clay soil that were either uprooted or had severe stems snapped.

Avoid “Victim” type trees if possible in the urban setting.

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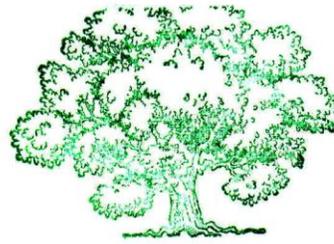
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Hurricanes & Trees

Hurricane and the Landscape “Prepare Your Site”

We have all learned that once the northern cool fronts have faded away, southern oceanic waters warm thus making conditions right for hurricanes and they seem to start appearing earlier and earlier each year. Living in south Louisiana, we all know the meaning of “getting ready” for the storm means stocking batteries, candles, water, canned goods and first aid supplies.

We need to also start thinking about “getting ready” the landscape that surrounds our home or business.

Trees and shrubs can provide a valuable buffer zone that can reduce storm damage. Studies show that foliage density and topography modify wind speed and direction.

WIND RESISTANT VEGETATION

High winds and storms can cause damage to trees. New studies of trees following hurricanes offer new knowledge to the ***Hurricane-Resistant Landscape***.

Trees can be classified now as “**Survivor trees**” and “**Victim trees**”.

SURVIVOR TREE – It is a compact tree, that has a major tap root and well-developed secondary roots. It also has a well-tapered trunk, and its center of gravity is low. Survives a storm well. Example – Live Oak

VICTIM TREE – It is weighed down by a dense canopy and possesses a high center of gravity. They are generally fast growing, weak-wooded and shallow rooted. Does not survive the storm well. Examples – Pecan and Pines.

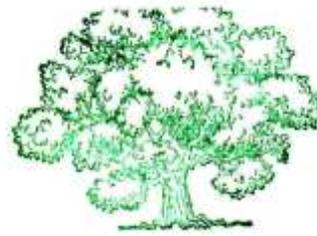
PROFILE OF WIND RESISTANT TREES

1. Native Species
2. Slow Growing Trees
3. Hard Woods
4. Young to Middle Age Tree
5. Very Healthy and Vigorous
6. Well Maintained
7. Low Center of Gravity
8. Deep Penetrating Radial Roots
9. Open Branching Character
10. Heavy Stout Leaders, Flexible Limbs and Short Leaf Branching
11. Small, Fine Textured Leaf
12. Deciduous Leaves

SURVIVOR TREES –

LSU LANDSCAPE PROFESSOR D. G. “BUCK” ABBEY LISTS HIS TOP 10 FAVORITE HURRICANE-RESISTANT TREES

1. Bald Cypress
2. Live Oak
3. Sabal Palm
4. Windmill Palm
5. Mexican Fan Palm
6. Black Gum
7. Cow Oak
8. Iron Wood
9. Shumard Oak
10. Winged Elm



Hurricanes & Trees

PRE-STORM ACTIVITIES FOR TREES & STRUCTURES

Analyze the site to identify potential damage that could be inflicted upon vegetation, structures and drainage systems.

1. Check all trees for root system vigor.
2. Stake all recently planted trees.
3. Thin dense canopy trees to reduce wind load.
4. Remove all trees weakened by construction damage, utilities installation or just old weakened trees.
5. Remove all weak-wooded, fast-growing trees. Replace with slowly growing light-canopy, deep-rooted native trees.
6. Remove all limbs overhanging utilities, rooflines and within the "drop diameter" of structures.
7. Follow recommended fertilization practices for trees.



8. Brace arbors and pavilions.
9. Design/remove "wind gap panels" in fences.
10. Inspect all drain lines/channels; remove obstructions.
11. Document site with photography.

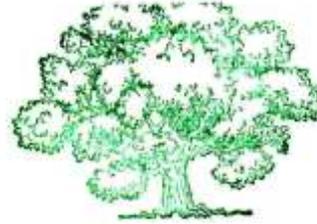
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Hurricanes & Trees

POST-STORM ACTIVITIES ON TREES AND STRUCTURES

Sometimes despite our well-intentioned efforts, the landscape suffers, and we must begin rebuilding or reconditioning the site.

1. Conduct structural damage assessment of trees and structures.
2. Examine trees for systemic damage.
3. Clean salt spray from all trees. Hose off.
4. Perform aesthetic pruning on damaged trees.
5. Upright and brace upturned small trees.
6. Remove all overturned trees and trees with failed trunks.



7. Grind out stumps and replace trees.
8. Remove victim trees and replace with survivor trees.
9. Remove temporary bracing.
10. Make repairs to site structures.
11. Replace damaged fence panels or boards.
12. Document site damage with photography.
13. Submit written report to insurance company.

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Hurricanes and Trees – Fact Sheets

Situation - As we all know, when the gulf waters begin to warm up, it signals summer is near. It also signals the beginning of hurricane season. Living in south Louisiana, we all know the meaning of “getting ready” for a storm means stocking up on batteries, candles, water, food and first aid supplies.

Due to past hurricanes and the damage they have caused to the landscape and property, I was asked to develop information that would help “get ready” our trees and landscape.

I already knew that trees and shrubs can provide valuable buffer zones that can reduce storm and wind damage. Living where I do, I also knew how much destruction of property and life that trees can cause from a storm.

Ways to help eliminate some of the destruction around the home needed to be addressed.

Action - Several years back, Hurricane Andrew blew through Louisiana and damaged homes, buildings and destroyed many of the urban trees in the landscape. The county agent knew the importance of trees in forming buffer zones from the wind, but also saw how much damage trees did to homes and businesses because of improper management and placement of trees in the urban setting.

Others were aware of this also, as they asked if I could develop a public awareness on this. I felt everyone knew what “getting ready” meant in a hurricane. I wanted the “getting ready” word out about what to do before and after a storm in relation to trees around the home. With this in mind, I asked our communication department specialist to help me with a display and fact sheets on hurricanes and trees.

She was instrumental in developing a professional display board and set of nine fact sheets that tell you what to do before a storm and after a storm and what species did better after the storm.

Impact - The agent with the expertise of the communication specialist developed a traveling display and a set of nine fact sheets on hurricanes and trees.

The fact sheets have been put on the LSU Internet web-site and the School of Renewable Natural Resources web-site. They have been used in news articles and public service announcements.

The display has been shown at three home and garden shows in the state last year and reached over 8,000 people.

This year, it has been reserved for the Houma Home and Garden Show and the new Baton Rouge Garden Show. Agents have requested it for Master Gardener classes and for passing out at various Extension related functions.

Fact sheets continue to be requested for various garden clubs, master gardeners and general information about trees.

Funding Sources - Funding for the project involved staff time for the county agent and communication specialist. The communications department provided the funding to make the display and fact sheets professionally designed and useful to the general public of the state.



Hurricanes & Trees

SAVING SMALL UPROOTED TREES

After a storm, you may encounter trees that have been wholly uprooted with the rootball intact. Sometimes you may be able to upright **small** trees and save them.

STEPS TO FOLLOW

STEP 1 Cover the exposed roots immediately to keep them from **drying** out until you can make arrangements to restore the tree to the upright position. Use wet burlap, hay, sand, mud, plastic sheets or any convenient material to retard drying.

- Just before you right the tree, cut away any shattered roots.

STEP 2 Upright the tree. If the tree is small enough, upright it yourself. If it's too large, try block and tackle, winch, etc., equipment. When lifting, protect the bark with padding where pressure is applied to the trunk, branch, etc. Look at the root system carefully. You may need to prune or cut back part of the crown to compensate for root loss.

STEP 3 After the tree is restored to its original position, install guy wires to hold it in place until the root system regenerates. Use at least three guy wires. Use a short length of rubber

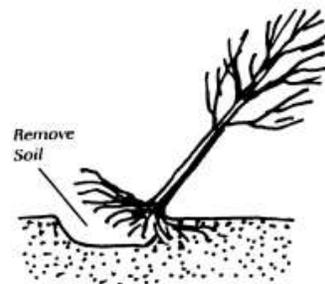
hose around each wire to protect bark from injury. Fasten the wires securely to stakes in the ground.

* Check guy wires often so they do not grow and cut into the trunk. Wires may have to be left in place for a year or two.

STEP 4 Water the tree well. Water slowly for a long period. Watch for insects and disease pressure. Small trees can generally be saved if you follow the steps above.

Trees with a diameter of 10 inches or more are often too heavy to upright and usually do not survive.

Be careful when handling trees.



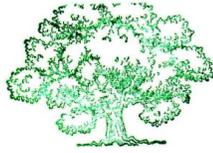
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6. LIGHTNING STRIKES

Lightning is a life threatening situation. Lightning either moves in a narrow line down the branches, stem and roots or along a wide pathway encompassing the entire tree cylinder. Lightning directly **destroys** tree tissues by electrical disruption and heat. **Steam** explosions down the stem, in a wide or narrow band, show where electrical current has moved through the tree.

***Massive root** damage can remain *unseen*. Damage caused by lightning leads to extensive water loss which is also life threatening to the tree. Pest quickly attack a lightning weakened or damaged tree.

***Tree death** may occur *quickly* after a lightning strike or it may take *several months* before tree death.

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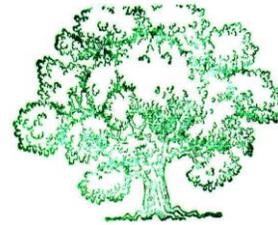
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Hurricanes & Trees

Six Types of Storm Damage to Trees

There are six main types of storm damage done to trees.

1. BLOW-OVER

The tree is physically pushed over by high winds. Main causes or contributing to this are past tree abuse, poor maintenance of tree and pest problems.

2. STEM FAILURE

Trees do not heal wounds. Trees can only grow over old wounds and seal them off. These old injury sites and old and new wood are structurally weaker than normal solid wood. Pest damage weak wood around old wounds, new wounds, and failure of the tree to adjust to wind conditions can lead to stem failure.

**Trees with heavy crowns can snap stems in heavy winds.

3. CROWN TWIST

Tree crowns are the leaves and supporting twigs and branches. Many trees through past abuse or poor pruning and maintenance have lop-sided crowns. More wind load on one side than the other produces a twist and weakens the crown and stem of the tree.

4. ROOT FAILURE

There are two basic types of tree roots: **fine** (*absorbing roots*) and **woody** (*structural roots*). **Absorbing** roots have a massive surface area but are **weak**. **Structural** roots are **woody**, have a relatively small surface area, but are strong.

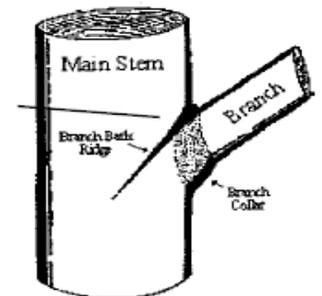
The primary roots growing from the bottom of the stem (root collar) play dominant roles in holding the tree upright while conducting water, essential elements and nutrients. If roots are constrained, diseased or damaged by construction, or as the top of the tree becomes larger, greater stress is put on the roots. Pulled or snapped roots cause trees to fall or lean.



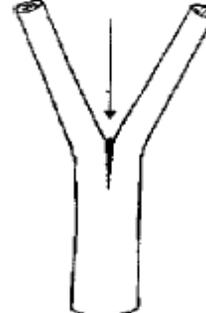
5. BRANCH FAILURE

Branches are poorly attached to the main stem. A branch is stuck on the side of the stem each year by a small layer of stem wood called the branch collar.

Heavy loading and twisting can stress the branch collar area and cause cracking, splitting and breaking.



Area of Included Bark



FORKS (or co-dominant branches) are structurally weak and splitting can occur due to a weak crotch area. These types of stems should be corrected early in the tree's life.