Reduction Pruning
Restoring Storm Damaged Trees

W.J. Rowe II
Community Forester
Alabama Cooperative Extension System
Looking for a path back from this
To this
Pruning: The Basics

The goal of guiding tree growth to an ideal of strength, longevity, and aesthetic appeal.

• cuts carefully selected
• carefully controlled
Great city and landscape trees are guided not grown or ‘renovated’

Success is extremely dependent on starting young and being consistent
In the aftermath of storms the method is no different to
Always Proceed With A PLAN

Keep in mind the tree’s

• Use
Always Proceed With A PLAN

Keep in mind the tree’s

• Use

• Future
Always Proceed With A PLAN

Keep in mind the tree’s

- Use
- Future
- The Investment
Pruning program: large maturing trees

<table>
<thead>
<tr>
<th>Time needed to restore:</th>
<th>Young (under 10” dbh*)</th>
<th>Medium-aged (10-20” dbh)</th>
<th>Mature (over 20” dbh)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>• 2 – 4 yrs.</td>
<td>• 3 – 5 yrs.</td>
<td>• 5 + yrs.</td>
</tr>
<tr>
<td></td>
<td>• about three visits</td>
<td>• three to five visits</td>
<td>• five or more visits</td>
</tr>
</tbody>
</table>

* dbh – diameter at breast height
** These measurements are approximations to help determine age, but vary with species and growth rate.

Slide by Dr. E. Gilman, University of Florida
**Pruning program: small, ornamental trees**

<table>
<thead>
<tr>
<th>Time needed to restore:</th>
<th>Young (under 5” dbh)</th>
<th>Medium-aged (5-10” dbh)</th>
<th>Mature (over 10” dbh)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>• 2 – 3 yrs.</td>
<td>• 3 – 4 yrs.</td>
<td>• 4 + yrs.</td>
</tr>
<tr>
<td></td>
<td>• about two visits</td>
<td>• about three visits</td>
<td>• four or more visits</td>
</tr>
</tbody>
</table>

* dbh – diameter at breast height

** These measurements are approximations to help determine age, but vary with species and growth rate.

Slide by Dr. E. Gilman, University of Florida
Pruning Workflow

Examine the Tree
Remove the D’s First

- Damaged
- Dead
- Dying
- Diseased
- Deformed
Pruning: Post Storm

Order of business:

• Safety
  • Remove hanging branches
  • Avoid any power line entanglements

• Tree Assessment
  • Is this tree keep-able?

• Health
  • Make the cuts that will limit future problems

The rest, beauty, maintenance is in the future
The Best Tools for Pruning

Common Pruning Tools

How to Prune, Alabama Cooperative Extension Publication ANR-512
Branch diameters from <1/4 to ~1 inch

Branch diameters from 1 inch to 2 inches

Branch diameters from <1/2 inch to ?
NOT The Best Tools for Pruning
Pruning: The Basics
Making the Cuts

Remember the Anatomy!

• Bud

• Lateral

• Terminal
Pruning: The Basics
Making the Cuts

Remember the Anatomy!

- Branch Collar
- Branch Bark Ridge
Pruning: The Basics
Making the Cuts

Three Point Cut

Natural target: branch collar or branch bark ridge

Why?

Artwork by United States Forest Service
Pruning: The Basics
Making the Cuts

• If branches are allowed to fall without support, trees can be injured as shown here

• Branch should have been undercut first to prevent this

• Use 3 Point Cut
• Note the circular cross section of an appropriate cut

• The branch bark ridge and collar are intact in all three cuts

• The woundwood on the lower cut forms a circular pattern and indicates a good cut
Pruning: The Basics
Making the Cuts

Three Point Cut

Natural target: branch collar or branch bark ridge

Conifers identical with usually more easily seen branch collars. Sometimes almost embedded in trunk.
Pruning: The Basic Techniques
Making the Cuts

Branch Bark Ridge

Collar not evident, use branch bark ridge as a guide
45° angle from top of the ridge to base of branch

Photo courtesy Bugwood: University of Georgia
Pruning: The Basic Techniques

1) Thinning / Reduction Cut

Removing a branch to a point of origin

Leaves the tree with a lateral or leader large enough to assume dominance

This is the preferred pruning method

• Tree becomes more open
• Tree retains its natural form
• Guiding and shaping trees without breaking the tree’s own form

Pictures by Dr. E. Gilman, University of Florida
Pruning:
The Basic Techniques

1) Thinning / Reduction Cut

Utility Line Clearance

Crown Reduction
Pruning:
The Basic Techniques

1) Thinning / Reduction Cut

Crown cleaning

Excessive cleaning
Example of damaged tree after crown cleaning
Example of tree over pruned

Note the tree is missing too much canopy
Example of tree after canopy cleaning
Somewhat acceptable
Pruning: 
The Basic Techniques

1) Thinning / Reduction Cut

Crown Raising

Pictures by Dr. E. Gilman, University of Florida
Pruning: The Basic Techniques

1) Thinning / Reduction Cut
   Excessive Crown Raising

Lions tailing
Pruning: The Basic Techniques

Use the following decision guide for size of branches to be removed:

• under 2 inches diameter go ahead

• between 2 and 4 inches diameter think twice

• greater than 4 inches diameter have a good reason
Pruning:
The Basic Techniques

Large pruning wounds are difficult for trees to deal with
Pruning: The Basic Techniques

2) Heading/Tipping

Removing a branch or leader to a much smaller branch or bud

Leaves the tree with a lateral or leader not large enough to assume dominance

Used for specific reasons
• Removing old flowers
• Shaping flowering trees and shrubs
• Hedging shrubs
• Specialized pruning styles
• Forcing lots of new growth

Pictures by Dr. E. Gilman, University of Florida
Pruning:
The Basic Techniques

2) Heading/Tipping

Result is lots of twiggy upright growth, shaped or unnatural form
Not Pruning

Topped trees should be regarded a strong risk for future failure and topping is not usually correctible.
Do not top your trees!

Topping severely reduces the entire canopy of a tree, cutting large limbs back to stubs.

This practice is very harmful to the health of the tree.
Reduction Pruning: Canopy Cleaning

Make clean cuts on stubs, breaks, and tears.

Reduce back to lateral branch if one is present.

Pictures by Dr. E. Gilman, University of Florida
Heading cuts are used when no laterals are nearby

Picture by Dr. E. Gilman, University of Florida
Amount of damage

More than 50% canopy loss: Monitor carefully over two year period and decide whether tree is recovering or declining.
Sprouts emerging
Re-growth will be aggressive and quick

Epicormic branches are most often poorly attached

Selective pruning in the years ahead will help maintain safety and guide the tree to stability

Remember: Removal is always an option...
After first restoration pruning

Rapid re-sprouting of new branches and foliage to feed the tree

Picture by Dr. E. Gilman, University of Florida
The Future: Further pruning required

- Careful selection of branches from the sprouting re-growth
  - make selection on which branch shows best potential to take over dominance of the branch
Over time, sprouts develop woody stems and can grow into strong lateral branches but they need your help!
Sprout management

Before sprout management

After

New leader

- Remove
- Reduce
Establishing new leaders

- New leaders can seal over damaged tips on broken stems 4 inches or less in diameter.
- Larger stems (2 - 4 inches) = more time and sprout management.
Storm breaks off top

Slide by Dr. E. Gilman, University of Florida
Reduce back to lateral
One year after initial damage
Example suggestions
Pruning: 
Hiring it done

Is the job within your reach?
Pruning: Hiring it done

What you should expect

• Professional
  • If possible hire ISA Certified Arborists

• Wear’s safety gear

• Gives estimates in writing

• Has equipment and vehicles

• Has licenses and insurance
Pruning:
Hiring it done

Ask for their **proof of insurance**.

Look for the words ‘Licensed and Bonded’

They should have:
- Personal
- Property
- Liability
- Worker’s Compensation
Chain Saw

Common causes of injuries

- cutting above head
- kickback
- using saw one-handed
- careless cutting

Head area 10%
Upper body 10%
Hand area 35%
Upper leg Knee Lower leg 35%
Foot area 10%

How to prevent them

- cut below head level
- cut slowly
- keep both hands on saw
- wear protective equipment

U.S. Consumer Products Safety Commission, 1999

Slide by Dr. E. Gilman, University of Florida
Personal Protective Equipment (PPE)

- Professionals tree workers are required by law to use PPE
- Homeowners should wear the same protection as the professional or NOT do the work!

Photo courtesy of Kevin Eckert

Slide by Dr. E. Gilman, University of Florida
Chainsaw Safety Critical Part of Storm Cleanup

1. If you have not been trained, you cannot fell a tree safely! Many YouTube videos contain mistakes in tree felling when the person is nervous but safe and perhaps regretful about the property damage that resulted. These people narrowly escape serious injury often without a real recognition of it. Manufacturers, distributors, and dealers as well as professional arborists and loggers offer training in your area. Attending one of these will reward you with safe operation and the extended life of the tool.

2. Don’t operate the saw without the proper safety gear. It is tempting to say that you only have this one cut to make so why should you put on all this gear. One cut is all it takes to send you to the emergency room. The same power that makes the tool so useful is what makes it so dangerous.

3. Understand kickback forces. Kickback forces are generated when the upper corner of the bar tip contacts an object. Contact in this area causes the saw bar to move violently, and chainsaw cuts to the head, shoulders, hands, legs and feet are related to kickback reaction. If you understand how kickback forces are generated, you can handle the saw in ways that greatly reduce kickback.

4. Don’t operate the saw when you are tired. You can rake leaves or push a mower all day long. If you make an error because you are tired, it is no big deal. An error with the saw can be deadly. In addition if you are wearing the proper gear, you are likely to get hot and dehydrated even faster.

5. Understand compression and tension forces is wood. On a tree that fall or breaks, the stems and branches have reacted to the weight pushing down and the ground or logs below that support it. In a branch that is bent, the inside of the bend has compression forces that can pinch the bar if sawn into. The outside of the bend is under tension and cutting into it can release explosive forces when the operator could be injured by the branch or the saw. Because the tree might slide as it falls, it may not be easy to distinguish compression from tension.

6. Keep both feet on the ground, both hands on the saw, and the saw bar below your shoulders. Professional tree services and arborists have training and equipment that enable them to cut branches from standing trees. Leaning a ladder against a tree to cut a limb can be disastrous for the novice. Working from a ladder adds all the hazards of operating a saw to the hazard of falling, which produces injuries just as serious as the saw and the tree.

County Name and Address and Phone Number

Sources: Mathew Smith, Extension forestry specialist

Published by the Alabama Cooperative Extension System (Alabama A&M University and Auburn University), an equal opportunity educator and employer

www.aces.edu
Review

Remember the cuts
Immediately following storm

Remove all hazards:

- Fallen tree or branch near power lines
- Broken, cracked, and hanging limbs located near property
- Large, fallen trees blocking traffic areas

DANGEROUS!
Only experienced workers should handle these situations!

Call utilities or hire fully licensed professional arborists to deal with any tree touching or near power lines

Slide by Dr. E. Gilman, University of Florida
Immediately following storm

Clean canopies of damaged trees:

**Remove** broken, hanging stems first so that branches do not fall and cause injury.

*Slide by Dr. E. Gilman, University of Florida*
Restoration Takes Time

After the storm:

Expect to spend at least 2 years working on the tree

Yearly work to restore a safe structure

Be certain to provide water if the tree is not receiving any rainfall

Picture by Dr. E. Gilman, University of Florida