Hurricane Damage Reduced in Trees Pruned for Strength.

Prepared by Joe Garofalo* and Terry Lytle*

We live at a dangerous latitude. Tropical and non-tropical weather systems occur often here, including severe thunderstorms, hurricanes, and other wind events. Hurricane Andrew woke us to that reality. He ravaged southern Miami-Dade County and changed all of South Florida; and one day a storm of equal or greater intensity will strike the region. Are we ready?

There is nothing we can do to stop bad weather, but we can prepare for it. This fact-sheet details a real-life example of what can be achieved with proper planning.

Trees, especially the larger specimens, are frequently damaged in hurricanes. Entire trees may fall, or branches may be broken, often causing major damage to vehicles, structures, and utilities.

This type of damage can be minimized if good trees are selected and if they are trained for structural strength, starting when they are planted. This is not theoretical information taken from a dusty old book. The example presented here is real-life experience here in South Florida.

THE BIG ONE: ANDREW.

The City of North Miami lies approximately fifty miles north of Homestead, where the eye of Hurricane Andrew made landfall. The winds were less severe in North Miami than in Homestead, as shown in Table 1.

Table 1. Windspeeds, Hurricane Andrew.

	North Miami	Homestead
sustained winds	58 mph	165 mph
wind gusts	71 mph	177+ mph

DAMAGE.

When Hurricane Andrew hit Miami-Dade County in August of 1992, the winds destroyed more than 1,000 mature trees located on public property throughout the City of North Miami. The cost for the clean-up was over $1,000,000.

An after-storm evaluation determined that many of those trees could have survived had they been pruned differently.

STRUCTURAL PROBLEMS.

The structural failures of city trees were caused by the faults listed in Table 2., all of which could have been corrected by proper pruning.

Table 2. Causes of structural failures.

1. co-dominant leaders.
2. included bark.
3. over-lifting ("lion's-tailing").
4. vigorous, poorly-attached growth (caused by "hat-racking").
5. limbs not spaced vertically.
6. crown imbalance (limbs not spaced horizontally).
7. narrow angles of stem attachment.
8. crossing branches.
9. in-growing branches.
10. overly dense canopies.

CORRECTIVE ACTIONS.

Obviously, something had to be done to reduce tree damage in future storms and the cost of cleanup.

The first step was to make a complete, computerized inventory of all trees on public property, creating a data-base that would make possible better management.

Once the data-base had been created, problems were identified for each city-owned tree. These structural problems were prioritized so the worst could be addressed first.

After any pruning work was done on a city tree, a follow-up evaluation was made, and any needed additional pruning was scheduled.

PRUNING METHODS.

During this period, three Extension Agents provided training, literature and advice on pruning.

Work began to correct the structural faults of existing trees, i.e., those which had survived Andrew. Pruning followed the recommendations of state specialists and local agents with the University of Florida Cooperative Extension Service. (See *Sources of additional information* below.)

All new trees purchased were grades Florida Fancy or Florida No. 1. These grades, determined using Florida's *Grades and standards for nursery plants*, indicate trees requiring little or no corrective pruning at planting.

REAL-WORLD TESTS.

The "No-Name" storm (also known as "Storm of the Century") in March, 1993, and Hurricane Irene in October, 1999, both produced winds similar to those of Hurricane Andrew (See Table 3.), but did much less damage.

Table 3. Windspeeds, two later storms.

	No-Name	Irene
sustained winds	ca 58 mph	46 mph
wind gusts	ca 71 mph	56 mph

COMPARISON.
In the 1993 and 1999 storms combined, 35 trees were lost, compared to over 1,000 for Andrew. The cost for the cleanup was approximately $35,000. Most important for maintenance of the urban forest canopy, there was only minimal damage to tree crowns.

BUILDING A STRONGER TREE.
City officials studied their inventory data-base and the structural faults identified earlier (Table 2.) which resulted in failure of branches or entire trees during Hurricane Andrew.

Using that information, they were able to determine that the steps listed in Table 4. produce stronger, more durable trees, resulting in a canopy which will mostly survive, and still be there after a storm.

Table 4. For a stronger canopy.

1. select trees with good structure, Florida Fancy or Florida No. 1.
2. training and care during the first years are critical.
3. prune all trees for strength.
4. identify and prioritize problems with established trees.
5. prune to correct flaws. Realize that large trees will require years of corrective pruning,
6. so don't try to correct all the faults in one pruning–don't overprune.

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SOURCES OF ADDITIONAL INFORMATION.

Gilman, E.F.. 1997. *Trees for urban and suburban landscapes: an illustrated guide to pruning*. Delmar Publishers, N.Y..

Gilman, E.F., and R.J. Black. 1994. Pruning landscape trees and shrubs. Cir. 853, Florida Coop. Ext. Serv.. 13 pp.

Anonymous. 1998. *Grades and standards for nursery plants.* Florida Dept. Agric. and Cons. Ser., Tallahassee. pp 1-56.

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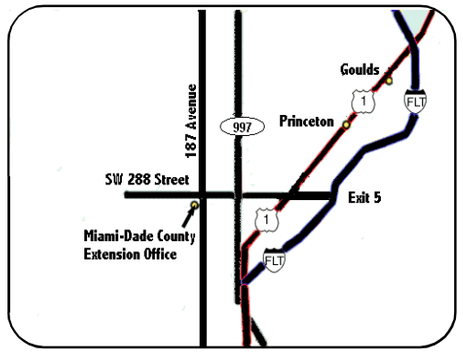

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