Protection, Service and . . . Profit

The bigger and more valuable the tree, the likelier target it is for lightning injury or destruction. This large white oak in Indiana, a huge specimen of the species found to be struck most often, is in an area of above-average thunderstorm activity. Its protection was a sizeable job.

Everybody stands to gain from a reported trend in our industry — a noticeable increase in purchase of lightning protection materials for trees by arborists and supply houses. Obviously, a growing number of tree protection systems are being installed by people in an excellent position to do so properly and profitably — arborists or tree experts.

The benefits to customers are great for lightning is a major crippler and destroyer of trees and the danger is greatest to those shade and specimen trees that are oldest, tallest, and most valuable. Future generations benefit, too, when historic and irreplaceable trees are protected.

And there are at least a half dozen advantages for us. I have been interested in lightning protection for valuable trees since my early training in the '30's and feel an obligation to advise customers to protect their trees against this danger. We have found that we have gained in the following ways from our lightning protection work with trees:

1. Added business is gained without much additional investment for our trucks, ladders and tools are largely the same.

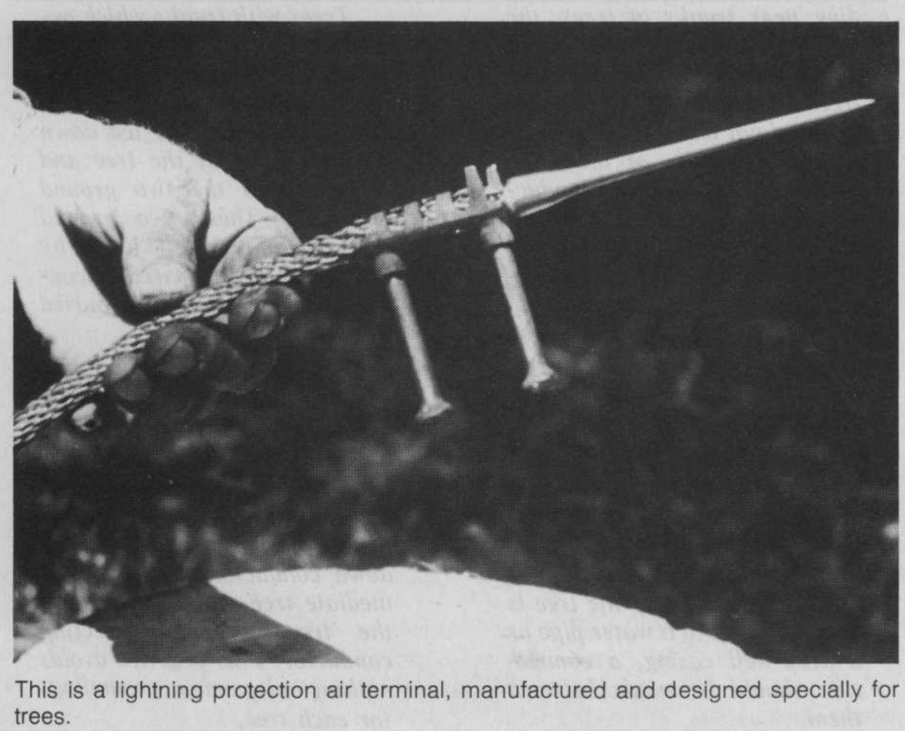
2. Installation techniques and skills also fit our current knowledge and training. Methods of fastening equipment to trees are quickly learned by our crews. In fact, a skilled climber is in demand in the lightning protection installation business as well as in ours.

3. Lightning protection work is profitable for manufacturer-suppliers furnish counsel and even layouts, as well as special materials when and as needed.

4. Sales leads come naturally and easily for customers whose trees have been damaged by lightning come to us.

By JOHN Z. DULING, Duling Tree Expert Co., Muncie, Ind.

Lightning protection installation comes naturally. It fits the knowledge, tools, skill and experience of tree climbers.



This is a lightning protection air terminal, manufactured and designed specially for trees.

5. There is great satisfaction, I find, in furnishing to customers a means of preventing damage, as an alternative to repairing it after lightning has struck, provided it is repairable.

6. Finally, lightning protection materials, equipment, sales, methods and manpower all fit so well with our basic business that it can be encompassed profitably in an over-all business sense. You can offer a valuable service as a profitable expansion

Why and How Lightning Strikes

Lightning strikes trees because they are better conductors than air. Trees most likely to be struck are lone trees, the tallest in a grove, those at the edge of a grove toward an approaching storm, and trees located close to buildings where wiring or plumbing might enhance ground conductivity.

From thousands of lightning property losses reported over a two-year period, the LPI picked 1,000 losses, large and small, in which the lightning bolt's point of entry into the house was known. In 112 of those cases, or 11.2 percent, the bolt first struck a tree, then flashed to the house in search of better ground.

Lightning codes require the house to be fully protected with separate protection on each tree taller than the house which is within ten feet of the building.

Safety a Major Factor

The need to preserve trees of historic or sentimental value has, in the past, been the main motivation for installing protective equipment. However, other factors, such as the desire to protect buildings, cars, and people from the damaging side effects of a lightning bolt striking a tree may enter into the picture.

From 80 to 90 percent of all livestock deaths in the United States are caused by lightning bolts. Among cattle, one-third of such deaths occur under trees where the animals have sought shelter.

It is reported that more oaks are struck than any other species. But, there may be more oaks in heavier storm areas. All other factors equal, a tulip tree in a grove of trees containing all species is said to be the likeliest target.

A study has shown that the species most often struck by lightning to be in this order: oak, elm, pine, tulip tree, poplar, ash, maple, sycamore, hemlock, and spruce. Species struck least often are beech, birch, and horse chestnut.

Golf courses lead as sites of outdoor lightning casualties, both those under trees and in open shelters; course owners could equip trees, as well as shelter houses, with lightning protection. So could picnic ground owners, park boards or managers and many home owners.

Probably the biggest single factor in the increase in lightning protection installations is the fact that a turning point has been reached where generally it is more expensive to remove a lightning struck tree than to protect one.

In new outlying residential areas, particularly, real estate appraisals put values on trees that, when viewed against their increasing vulnerability to lightning as they grow taller, makes protection very wise and desirable.

How Installations Are Made

There are several codes and standards covering lightning protection installations for trees. The National Arborist Association now has a standard; the National Fire Protection Association's Lightning Protection Code has a section on tree protection, as does Underwriters Laboratories' Master Label Requirements. The Lightning Protection Institute's new Code includes this tree protection standard:

One main cable should be coursed from the air terminal at the top of the main trunk or branch to the ground terminal. Acceptable secondary conductors should be coursed from miniature branch points, as far out on the main branches as possible to the main conductor on the tree trunk.

To avoid possible injury to roots by locating depth grounding near trunks of trees, the conductor should be extended out and away from the base of a tree in a shallow trench to a distance of not less than 12 feet or to the extremity of the overhanging branches. This conductor should terminate in a ground terminal. (It should be kept in mind that usually the underground spread of the roots of the tree is equal in area to the spread of the tree branches above ground.) Depth groundings should be made outside the area of the root spread.

If the grounding on a protected building is within 25 feet of the tree, the two systems should be interconnected. If the tree or grounding of the tree is within 25 feet of a water pipe or a deep-well casing, a connection should be made between them.

Trees with trunks which exceed 3 feet in diameter, and which have extra long branches, should have two down conductors. They should be led down opposite sides of the tree and connected to the two ground terminals. These two ground terminals may well be joined by a circular or semi-circular conductor or a counterpoise buried in a shallow trench.

If there are several trees in a row (all major trees), the ground terminals of two trees not more than 80 feet apart may be interconnected by a trench conductor coursed to the base of each intermediate tree. The down conductor of each intermediate tree may connect with the 'trenched' interconnecting conductor. This practice avoids making independent groundings for each tree.

According to Code recommendations, two down-conductors are needed for large trees having trunks more than three feet in diameter. Cables lead from air terminals at top and on main branches to at least two grounds, located outside main root system.

This outstanding banyan tree in Cypress Gardens, Fla., is now protected against lightning. Installation was made during the National Arborist Association meeting in Tampa last winter.