A NEW ERA IN URBAN FORESTRY

by Michael R. Jones & W. Richard Rossman

Penelec foresters have developed a tree replanting demonstration program to show communities that there are alternatives to planting forest-type trees in an urban environment. The program consisted of removing trees near the conductors which required frequent pruning, and replacing them with trees that will grow to a mature height of approximately thirty feet. There have been five replacement programs completed in three Penelec divisions.

In the Northwestern Division a project was completed in Erie where 138 trees were replaced with 337 ornamentals. The species planted were Ohio Pioneer hawthorn, Cleveland Select callery pear and hedge maple. The Northeastern Division completed a project in Blossburg where 17 trees were replaced with 78 Winter King hawthorns. In the Northern Division projects were completed in the towns of Corry and Russell. In Corry, 65 trees were removed and replaced with 64 ornamentals. The species planted were Ohio hawthorn and Centurion crab apple. In Russell, 85 trees were replaced with the ornamentals: hedge maple, Bradford pear, Washington hawthorn, Siberian crab apple and oakleaf mountain ash.

The programs have generated an awareness from communities throughout the Penelec system. A continuation of the program has been developed in conjunction with the Pennsylvania State University and the Pennsylvania Bureau of Forestry, Department of Environmental Resources.

During the last half-century, electric utilities in the eastern United States have spent hundreds of millions of dollars trimming trees—trees that grow under, trees that grow over and trees that grow beside overhead electric wires. The dollars needed to take care of these trees are provided by electric service customers. Many of these customers are the same people who enjoy the benefits of the trees utilities prune—the trees that were planted to beautify properties and communities.

I doubt that anyone would question that trees enhance our towns and cities and make them more livable and beautiful for people. Electric service, too, improves our lives. Indeed, electricity has become a necessity in today's world. Conflict surfaces when both try to occupy the same space at the same time. One or the other can survive intact, but not both.

Occasionally electric companies suffer bad press when trees downed by storms knock out service for a long time. The real culprits are violent natural forces clashing with early design that put trees, meant to beautify the landscape, in the same place that electric service hardware would occupy.

In response to criticism of unreliable electric service, many utilities have been spending big bucks pruning and removing tree branches and sometimes entire trees that are responsible for power outages. Because of high costs and the unsatisfactory appearance of the trees, this approach isn't answering this widespread and difficult problem. I propose a different solution. One that I believe is cost-effective, and one with which both the power-user and the power-supplier will be reasonably happy.

When most of our cities and towns were founded in the 1700 and 1800's, the areas along streets were planted with native forest tree species simply because that's what was available. Today, our streets are lined with these Goliaths. Maples, oaks, willows and poplars that rise 100 feet and more and spread their trunks up to five and six feet in diameter line our lawns between sidewalk and curb. These areas may be only three to four feet wide. Look up and you'll see electric and telephone wires 25 feet directly overhead. Dig down and you'll bump into sewer lines and water lines three to four feet directly under the tree roots—which, by the way, are searching out those water sources. Grandpa's lack of choice

1.Presented at the Annual Conference of The International Society of Arboriculture in Keystone, Colorado in August 1987.

between native species and today's wide selection of ornamental varieties has left us with one big problem.

I suggest we replace the forest giants, when they become defective or when they begin to decline, with trees having characteristics better suited to urban areas.

Last year, Dutch urban foresters and researchers shared their knowledge of street design and tree selection with their American counterparts. We were shown examples of the latest in this forestry discipline throughout Holland. The best example, though, was in Eindhaven. This city of about 200,000 people was destroyed during World War II. The rebuilding has erased all the scars of war. Today the city and its surrounding residential areas is an outstanding example of the intelligent use of tree species that avoid conflict between utilities and movement of vehicles and people. The results are dramatic, beautiful and utilitarian.

I'm not suggesting that we need a war or other disruption to bring about sensible solutions to tree problems in the United States, but as the large, old trees in our communities are replaced, we have opportunities for better planning and better decisions in choosing tree species. Each of us has the responsibility and the opportunity to guide and change the way we think and the actions we take in replacing trees, an important part of our urban environment. We at Penelec know that when it comes to trees, good planning is necessary. Smaller trees mean more benefits for our customers and for Penelec.

There's no question that by themselves trees are beautiful. But next to power lines, near sidewalks or water lines and sewer lines, trees can become hazards disguised by foliage. Unlike our forefathers, we have a choice. We can plan the landscape to suit today's needs.

Smaller trees are pleasing to the eye and their benefits are many. For example, small ornamentals don't have the root systems that can cause damage to sidewalks and curbs. Some benefits of smaller trees can't be measured in dollars and cents, however. Children aren't as tempted to climb the smaller trees. Streetlighting won't be as obscured as it is by heavy foliage. These can be important safety considerations. On the other hand, tall trees have been costing us a fortune. In the last 50 years, electric utilities in the Eastern United States have spent hundreds of millions of dollars trimming trees growing near distribution lines.

Most of our customers don't have many trees to worry about; but when you're responsible for the care of thousands of trees a year, they constitute a major undertaking. Penelec trims and removes over 200,000 trees each year. The cost is in the millions of dollars—all of this to reduce interruptions to electric service. Ninety percent of our power interruptions during storms are caused by tree limbs that either break wires or cause short circuits. Not all trees are problems, but a tree that can reach sixty feet or more near power lines increases the risk of having major problems during wind and/or ice storms.

Penelec discovered 27 years ago how helpful selective planting could be. In 1960 we planted 3000 small ornamental trees under our distribution lines along some of the streets in Erie and Millcreek Townships. We wanted to reduce line-clearing work by planting trees of limited height.

Twenty-five years later about 1160 trees along 21 miles of right-of-way have survived that planting, and we have learned much from that experience. We've found that these trees have a high survival rate, are appealing to property owners and keep us happy by staying away from our lines. They are: Lavalle hawthorn, Washington hawthorn, Chinese cork, Flowering crab and Ruby Red horsechestnut.

Since that first experiment Penelec has finished five tree replacement projects that I'd like to tell you about. I'll start with a brief description of the projects in the Northwestern and Northeastern Divisions and conclude with a more detailed account of the projects in my territory, the Northern Division.

In the Northwestern Division, Penelec decided to pursue a project in Erie. The area selected was marked by heavy traffic, numerous tall trees and a high-priority Penelec power line—just the ticket for a demonstration project. Armed with our arsenal of benefits, to improve the appearance of the area, better continuity of electric service, reduced tree-trimming costs and the opportunity to demonstrate advantages of tree planning, we

easily progressed through preliminary steps.

Residents of the selected neighborhood responded enthusiastically to an opinion survey conducted at the request of the City Council. Council approved the project having received many supportive letters from the residents along the proposed project area. The tree species chosen were planted in November 1986. They were: Ohio Pioneer hawthorn - a thornless variety, Cleveland Select callery pear - a cone-shaped tree bearing white flowers in spring, green foliage in summer and reddish-yellow and purple foliage in fall, and hedge maple - a miniature maple producing yellow fall foliage. Penelec trimming crews removed 138 trees that had required trimming every three years, and replaced them with 337 ornamentals that will never require trimming.

At the same time we were also working in our Northeastern Division on three additional projects. The first project was completed in Blossburg, a community of 1753 people. The area chosen was a site where a street-widening project during the previous year had eliminated all but two trees under our primary conductors. We felt the area could certainly benefit from the planting of ornamental trees, before shade tree saplings could be planted by the property owners. During a preliminary survey, a second street was included which required the removal of 17 trees located under our primary conductors. A total of 19 trees were removed and replaced with 78 Winter King hawthorns. This species has whitish bark and bears fruit that remains well into the winter.

A second project was proposed in the Borough of Westfield. Four streets were selected because of their history of numerous tree related outages. Things seemed to be moving along well. Necessary approvals were obtained and we were at the point of letting out bids when opposition appeared. A lengthy negative letter to the editor was published in the local newspaper. Coincidentally, a large branch split from a tree causing an outage on one of the project streets only a few days after the letter appeared. Many supporting residents flooded the letter writer with phone calls. By this time it was late October and it was clear that the Westfield Tree Replacement Program would not be accomplished in 1986. Penelec received many supporting letters and decided to keep the project alive for 1987. To date, plans have been made for a fall planting.

Our third attempt in the Northeastern Division never got off the ground. Residents of Tunkhannock weren't happy with the idea of a Tree Replacement Program and they let us know immediately. A presentation was made at a regular monthly Borough Council meeting which was attended by a roomful of residents whose response bordered on hostile. The meeting was followed by many newspaper articles and editorials in the local newspaper. Unfortunately, not one person in favor of the project spoke out and the Borough Council rejected Penelec's plan.

Working as Penelec's Northern Division Forester, I cover an area of 2181 square miles containing over 1700 miles of distribution line. Concerned about managing the urban trees around Penelec conductors, we offered our Small Tree Demonstration Program to three towns during 1986. Our first project originated from a phone call by the City of Corry's Shade Tree Chairperson. She heard, through newspaper and radio coverage, about an ongoing project in a nearby Northwestern Division town of Erie, and told me of her interest in a similar project for her town.

Soon after her call, I conducted a survey of Corry to determine the most beneficial location for the demonstration planting. The area chosen was a 1.5 mile highly visible, well traveled section of town. The electric line along this location is a 35,000 volt main artery, which is a vital link to a majority of the cities, homes and businesses. Along this link were many large declining sugar maples, silver maples, Carolina poplars and other trees threatening the integrity of its service.

To introduce the project a formal presentation was proposed during an open session of City Council. Those in attendance learned the advantages of the project would be shared by both the utility and the city. Advantages for the community were: 1) improve community appearance, 2) reduce maintenance costs caused by excessive root growth, 3) improve light availability from streetlights, 4) reduce potential of storm damage from large trees, and 5) reduce potential of extensive power outages. Advantages for Penelec: 1) reduce outages caused by trees,

2) improve customer relations, 3) improve municipal government relations, 4) improve corporate image by showing concern for community appearance, 5) reduce liability from tree/wire problems, and 6) reduce friction between Penelec and customers resulting from tree trimming.

Details of the removal and planting phases were also discussed. With the approval of residents and Council each tree would be removed, which included removing the brush and leaving the wood for the property owner's use and grinding the stumps six inches below ground line. The replacement trees would be 2½ inches in caliper, balled and burlapped, and stand eight to ten feet high at planting. Each tree would be guaranteed for two growing seasons and would grow to a mature height of around thirty feet. Beyond the guarantee, caring for the trees would become the responsibility of each homeowner.

We suggested that the species of trees be selected from a list of candidates by the Shade Tree Committee with input given by community residents. Council's decision was to postpone approval of the project until a Penelec representative contacted each property owner involved, and obtained written permission from those who supported the program.

Shortly after the Council meeting, I began contacting the property owners living along the project area. The majority of those contacted were homeowners; however, some of the contacts were private businesses, a church, funeral homes, a shopping plaza and a fuel gas company. Although most of the people had heard about the project, very few people were aware of the details or what I like to call "the selling points". Most people's initial response was something like, "Oh, you're going to cut down all the trees" or "You're going to plant seedlings". Needless to say, most of my time was spent explaining the program to each property owner. Of the 72 property owners contacted, only two refused to participate. The first person, who didn't have a tree to be removed, said that she had too many trees around her house and didn't want any more. The other gentleman said that his old silver maple shaded the house in the summer.

The local newspaper provided coverage from start to finish. Most of the articles were written by a staff reporter, although some of the town's people contributed to the editorial ("Speak Out") column. One person wrote, "Why not wait until the trees along the streets are green before deciding which trees are diseased?" However, most of the editorials were favorable. One woman wrote, "Hurrah for Penelec. They're not only saving money for property owners, they may be saving a human's life. It's lucky that no one has been conked on the head by a falling dead limb."

Copies of the signed permission slips and a written proposal were presented to City Council who formally approved the project. The project was let out for bid and awarded to Hazlett Tree Service of Townville.

Hazlett began removing trees early in the spring with a five-man manual crew. This crew was able to remove most of the trees entirely. However on some of the larger trees, the crew would remove all branches and leave the large trunks for a two-man crane truck crew. After the trees were down, a two-man stump grinding crew removed the stumps. The crews worked with extreme efficiency and completed 65 removals in one month's time.

Planting began immediately after the removal segment of the project was completed. The Shade Tree Committee selected two species. The first was the Ohio Pioneer Dotted hawthorn. This tree is a thornless variety that produces white flowers in the spring and red berries in the fall. The other choice was the Centurion crab apple. The Centurion is a disease resistant variety that has glossy dark green foliage, red blossoms and small cherry red fruit. Most of the people I talked to were amazed at the size of the trees. One passer-by admitted to being against the project, but said he had changed his mind after seeing the size of the replacement trees. With the project complete, a total of 65 big old trees had been replaced with 64 beautiful and more practical ones.

About the same time the Corry project was getting underway, I set my sights on promoting another demonstration planting. The location selected was our Division Headquarters in Warren. I thought the experience I had gained in Corry would make getting approval for a project in this seldom-changing town a breeze. The site

selected would provide excellent exposure because it was along the main thoroughfare through town. Planted directly under the lines were 68 Norway maples. These trees, the most costly to prune, had been either topped or drop-crotched repeatedly and weren't the most beautiful site.

Dick Rossman and I made a presentation during an open session of Borough Council. We answered many questions and listened to comments from nearly all of the two dozen residents at the meeting. We agreed to a suggestion by a woman to attach an orange ribbon to each proposed removal tree which would give the public a better idea of the project. Most of the trees were located on Borough property; therefore, Council opted to gather public opinion and render a decision at a future session.

For weeks after the ribbons were tied around the trees, the local newspaper was flooded with letters to the editor. About ninety-five percent of the letters were against the program. People called the program "absurd" and "villainous". The Norway maples were referred to by most citizens as "beautiful old shade trees" and "stately giants". The newspaper also published a picture of a ribbon around our electric pole, suggesting we remove the poles and bury the lines. The local Garden Club got involved by presenting Council with a petition signed by 1700 residents against the program. Council unanimously rejected the proposal at a meeting a few months after our initial proposal.

The exposure Penelec received on the proposal in Warren turned out to be a blessing in disguise. A few months after things quieted down in Warren, I received a phone call from a woman in a town about five miles north of Warren. She introduced herself as the Chairperson of the local Beautification Committee and proceeded to inform me of her town's interest in the Small Tree Replacement Program.

The town, called Russell, is served by an important 35,000 volt line which passes through and eventually feeds a rural electric cooperative substation a few miles to the north. Practically all of the primary conductors were included in the project proposal. The trimming types along the 1.2 miles of line consisted of trees requiring repeated topping and large old trees each containing partially dead crowns above the conductors.

A public meeting was scheduled and most of the residents attended. Northern Division Director, Bud Greer, and I presented the proposal. We spent an hour after the presentation fielding many good questions. Most of the people at the meeting were in favor of the project. However, the Township Supervisors delayed approval until door-to-door contact was made to secure written permission by the majority of the property owners involved.

Members of the Beautification Committee took on the task of contacting the residents. Each person contacted received a copy of Penelec's Tree Replacement brochure and a map of the project area. The map showed each tree scheduled for removal and the location of each replacement. They were also invited to contribute their ideas regarding the type of species they wanted to have planted along their street. All but two of the property owners agreed to take part in the program. The Beautification Committee submitted their results to the Township Supervisors who subsequently approved the project.

Upon approval, plans began to let the project out for bid. Before the bid, I accompanied members of the Beautification Committee to a wholesale nursery where we spent the day selecting species for the replacement phase of the project. The project was awarded to Hazlett Tree Service. Hazlett began removing trees during the second week of September. They used a six-man manual crew with a two-man stump removal crew following behind. The removal phase of the project, consisting of 85 trees, was completed by mid-October. Planting began the following week. The species selected were: 1) Hedge maple (*Acer campestre)* - a miniature maple producing yellow fall foliage and corky stems of winter interest, 2) Bradford pear (*Pyrus calleryana)* -white flowers in spring and red or yellow fall foliage, 3) Washington hawthorn (*Crataegus phaenopyrum)* - white flowers in spring and bright red berries all winter, 4) Siberian crab apple (*Malus baccata)* - a disease resistant variety producing pink flowers and yellow foliage and red berries in winter, and 5) oakleaf mountain ash (*Sorbus thuringiaca)* - oak shaped glossy green

foliage and orange berries in fall. All trees were planted in three days. Were we successful? Yes—in more ways than one.

One way to measure the success of this program would be to evaluate the participation by the towns and their residents. In Russell, the township participated by removing seven additional trees and purchasing seven replacements. Two residents also purchased trees for planting near Penelec lines. In addition Russell has scheduled a continuation of the program for 1987. Township funds are being appropriated for the removal of several trees near Penelec wires. These trees will be replaced with low-growing species.

Early signs of community concerns pertaining to urban tree planning are springing up all over Penelec's Northern Division. Towns throughout the division have had their eyes on the changes that have taken place in Corry and Russell. The demonstration projects in Corry and Russell are visible teaching aides which are showing other communities that there are viable alternatives to planting the forest-type giants. Calls have come into my office from officials and Shade Tree Committee representatives asking for assistance in developing long-range tree planning programs. Small towns like Russell have budgeted money to plant low-growing species under electric lines, around walkways and near water and sewer lines. The City of Erie, one of the largest towns in our system, has agreed to plant Penelec-recommended varieties when replacing trees under our conductors. Actions like these are some of the most important reasons for implementing a Small Tree Replacement Demonstration.

A continuation of the project has been developed in conjunction with The Pennsylvania State University and The Pennsylvania Bureau of Forestry, Department of Environmental Resources. The goal of the project is to provide information that municipal officials can use to identify problem areas where trees need replacing and select the right species of tree for a specific site. This will be accomplished primarily through demonstration plantings, community workshops and street tree inventories.

That, in a nutshell, is what Penelec's Tree Replacement Program is all about—planning for trees best suited to a site. We believe that tree replacement is another tool available to the utility forester, and that it makes sense for the community and for the company.

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