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**Northeastern Forest Experiment Station
Forest Service, U.S. Dep. Agriculture
6816 Market Street, Upper Darby, Pa.**

TREE REPLACEMENT PROGRAM¹

by Chandler A. Hancock

Abstract: In the spring of 1973 Knoxville Utilities Board began the "Tree Replacement Program" as a possible means of reducing the overall cost of maintaining line clearance throughout our service area. The idea behind the program is to obtain permission from property owners to remove tall maturing, fast growing trees from under and alongside our power lines and replace them with low growing ornamental trees that in the future will need little or no pruning to maintain line clearance.

Objective

The objective of this program is to stabilize or reduce line clearance costs. The purpose of this program is not to eliminate every tree that grows near or under our power lines, but to remove only those trees that have an excessive rate of growth. These trees, which must be pruned on a routine basis, are, in most cases, not beneficial to the customer or the landscape. According to a study made before this project was initiated, if trees that now need pruning away from lines once annually are removed and replaced with low growing trees that never need pruning, it would provide instant savings in the area of line clearance cost. Therefore, whether a tree needs pruning once each year or once every five years,

a definite savings is realized with our present replacement program.

Hypothetical Example

For an example, let us take a hypothetical situation. Suppose a five-man tree trimming crew has a tree to trim from under a power line. The job takes only ten minutes to prune and clean up the debris. That isn't much time! But, if the average wage for each man on the crew is 5 dollars per hour and the overhead is 30 percent, the expense of trucks, brush chipper, etc., are all included, that ten minute job would cost \$8.74. If everything stayed the same and you pruned the tree every other year for the next twenty years, it would cost \$87.44.

In actual practice, we have found that the removal cost for trees such as this one just described is little more than the routine pruning cost would have been for that time. Then, assuming we have removed this tree, we know from past experience the cost of a five to six-foot, balled and burlapped, replacement tree including labor involved in planting has averaged approximately \$11.00 per tree. Then we can assume that for \$19.74 we can eliminate all future cost.

¹ Presented at the 52nd Annual Convention of the International Society of Arboriculture in St. Louis, Missouri in August of 1976.



Figure 1. Replacement of a removed tree with a dogwood in the utility right of way.

Inception of Program

With this in mind, through a cooperative program with the Line Department which is responsible for approaching the customer with this program and removing the unwanted trees, and the Properties Department which is responsible for procuring and planting the low growing trees, K.U.B. began this program.

The idea of planting low growing ornamental trees on the customer's property to compensate for the removal of low quality, fast growing trees near power lines had been considered for some time. In the spring of 1973, a decision was made to begin such a program as a means of reducing the overall cost of maintaining line clearance throughout our service area. For the year of 1976, K.U.B. has a budget of almost 3/4 million dollars for routine line clearance. This averages out to approximately \$1.00 per person in our service area.

One of the most popular and most attractive low-growing trees in the Knoxville area is the flowering dogwood. Therefore, this tree was used to start the replacement program. It is also a contribution to the community in light of Knoxville's annual Dogwood Arts Festival which occurs in the spring when the dogwood trees are in bloom. Thousands of people attend and participate in the arts and crafts shows along with the pageantry.

Although the Grounds Section of K.U.B.'s Properties Department maintains a nursery where

we grow most of the shrubs, trees, and other plants needed to supply the landscaping needs for the Board's property, we were not prepared to supply the trees needed to begin this project. An adequate supply of quality dogwood trees was located and purchased from a middle Tennessee nursery.

Results

Nearly 100 trees had been scheduled for planting at 40 different locations before the first order was received. Planting began around the first of November and continued through April. New requests were received daily from the Line Department as they trimmed and cut trees on routine schedule throughout the area served by the Board. At some locations and always with the customer's approval, only one or two trees are cut; while at others, many trees that serve little purpose in the landscape are cut.

Since placing the first order, this program has been very successful. We reordered trees twice that year and when planting time had ended we had planted 1005, five to six-foot, balled and burlapped, dogwood trees on more than 300 locations while removing 1201 trees from under and alongside our power lines.

Flowering crabapple trees and eastern redbud trees were added to our program for the fall of 1974 and spring of 1975. Although many of the crabapple and redbud trees were requested by the customer, the flowering pink and white dogwood are the most requested trees. In the fall of 1974 and the spring of 1975 we planted a total of 2039 trees while removing 2278 trees that required routine pruning. This gives us a two-year total of planting 3044 trees and removing 3437 problem trees. Through the spring of 1976 we have planted a total for the past 3 years of 5233 ornamental trees while removing 5809 problem trees since the inception of this program.

Cost Analysis

Before the problem trees are removed and replacement trees planted, a prepared written agreement is presented to the customer for his signature. The agreement states: "K.U.B. guaran-

	Trees Removed	Trees Planted	Cost*
1974	1201	1005	10,139
1975	2278	2039	18,548
1976	2335	2189	25,265
Total:	5814	5233	\$53,952

*Cost includes labor, vehicle, materials, and trees. Cost does not include removal of trees.

tees a live tree that will put out leaves the spring following planting; the tree becomes the responsibility of the customer at this point." This agreement protects us from having to return and make replacements possibly many times at the same location due to the lack of proper maintenance given the tree by the customer.

To aid the customer in the proper maintenance needed for the newly planted tree, we give each a copy of "THE FLOWERING DOGWOOD IN TENNESSEE," an 18-page publication from the University of Tennessee's Agricultural Extension Service. This gives them information on how to grow and care for their trees.

Forms and Procedures

When the crew foreman sees a tree or trees that must be trimmed and, in his opinion, offers little or no value to the customer's landscape, he approaches the property owner and explains our removal-replacement program.

If the property owner is receptive to the idea, the foreman then discusses the tree or trees that are to be removed and the type of tree the customer requests to be used as replacement trees.

This information is recorded on the order form, which includes the customer's name, address, phone number, number of trees removed, number of trees to be planted, type of trees to be planted, agreement with customer clause, customer signature, and foreman signature. One copy of the order form is given to the property owner, one is kept by the Line Department, and one is given to the Properties Department to be used to plant the trees.

After the trees are removed, the foreman then drives wooden stakes where the customer desires the new trees to be planted. We will plant the trees at any location. It does not have to be under the power line; although we prefer to replant under the power lines to deter possible planting of a fast growing tree in the future. In some instances the trees are delivered to the

customer, who in turn takes the trees and plants them at their summer cottage on the lake or in the mountains.

There are other ways this program has been beneficial to K.U.B. Recently it was necessary to acquire land for a new 66,000 KV power line. Some property owners were reluctant to cooperate due to the trees that had to be removed. When we suggested that we would replant some of the trees along the edge of the right-of-way, the property owners were more willing to accept our proposal. One engineer expressed that through K.U.B.'s willingness to replace trees along this right-of-way, it had saved thousands of dollars in the cost of acquiring the land.

Another area in which our Tree Replacement Program is working: The Knoxville Community Development Corporation, which is also an agency of the City of Knoxville, recently rebuilt a section of the City. Attractive low-cost houses were built and street trees were added. The landscape architect had 2" to 3" caliper sycamore, pin oak, and other fast-growing, tall-maturing trees planted directly under or alongside our power lines. In some locations, these trees are within three or four feet of the neutral when planted. Recalling our present problem in trying to maintain line clearance where sycamore trees were used as street trees some 20 years ago, we decided something should be done to eliminate this future line clearance problem. Meetings were set up with the landscape architect, planner, and management of the Knoxville Community Development Corporation and simply explained the future problems these types of trees planted under our power lines would cause in the future.

After reaching an agreement with K.C.D.C., the sycamore trees were removed, replanted at another location, and golden rain trees were planted where the sycamore trees were removed. The golden rain tree, planted at this location, will never need pruning, or, should some pruning be required, it will be minor. Other tall maturing trees will be removed in the future and be replaced with trees such as crabapple, redbud, and hawthorne trees.

*Knoxville Utilities Board
Knoxville, Tennessee*