

# THE COMPUTERIZED SELECTION GUIDE TO ASSIST WITH TREE REPLACEMENT PROGRAMS<sup>1</sup>

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A well structured tree replacement program is one component of a comprehensive vegetation management program.

Pacific Gas & Electric Company has been involved with a tree replacement program since 1984. The program has been effective but fluctuates depending on funding availability. In preparation for the 1990 rate case, data were collected on PG&E's tree replacement program and was submitted to the California Public Utilities Commission for review. PG&E requested funding for an ongoing project with a proposed expenditure of \$3.5 million on an annual basis.

Although essential, funding alone will not produce an effective program. A number of tools have been made available to our region and division personnel to assist them in establishing a tree replacement program.

We developed a booklet for customers, entitled "Trees: Planting for the Future," which recommends trees to plant near utility lines. As the program grew we found that a single booklet was not adequate to supply needed information to the customer or cities due to PG&E's diverse plant growth zones and soil conditions. In 1988 we began development of the PG&E tree selection expert system, which is currently available to our division personnel.

Another tool that was created by PG&E's East Bay Region Electric Department was a tree replacement program video which was used to introduce and explain the program to cities, counties and individual customers. This interaction will generally identify interested parties and possible locations.

Selecting the proper location for a tree replacement program is essential for success. Agreement with the tree owners, who may be residential customers, cities, or counties, must be secured. Project implementation is greatly facilitated if only one agreement has to be negotiated to secure permission to remove or replace trees. This may

occur when the city or county, rather than the individual homeowner, owns the trees.

The location selected should be one in which trees are interfering with service reliability. Good areas to target for replacement projects are also those in which customers are liable for damage by trees to county or city facilities such as sidewalks. Interference with traffic during tree removal and accessibility to dump facilities should also be considered in evaluating a site.

Proper tree selection must be accomplished prior to negotiating with customers. A relatively small list of trees, five at most, should take into account maintenance, pests, survival probability, drought tolerance, availability etc. By limiting the number of trees available to the customer you can in turn reduce the administrative costs involved in having the customer select the species. In addition a simple plot map should be prepared to allow the customer to select the planting location.

There are several areas that are open to negotiation with the individual homeowners, the city, or the county. The stumps may have to be ground after removal. The area may have to be reseeded with lawn seed. Firewood could be split and stacked. Root barriers may be required. But remember the less you agree to do, the more cost-effective the project will be.

I would like to cite two specific projects that were completed in PG&E's service territory.

The first project was located in San Lorenzo, CA where 700 trees were removed at an average cost of \$600 per tree. This cost included grinding stumps and splitting each tree for firewood. The trees (643) were planted at an average cost of \$115 per tree. This included material cost of the tree and planting. Administrative costs were quite high totaling \$156,000 for the project. The total cost of the project was approximately \$650,000.

Prior to the replacement of the many sycamores, averaging 30 inches in diameter, trimming in the subject neighborhood cost \$200,000

1. Presented at the annual conference of the International Society of Arboriculture in St. Charles, Illinois in August 1989.

annually. After the replacement project was completed in 1985, costs for trimming the area have been reduced to \$60,000 per year with no tree-related outages reported. As you can see cost effectiveness is based on long term goals.

The second project was located in Newark, CA where 578 trees were removed at an average cost of \$204 per tree. This cost included removal and stump grinding but no splitting. Trees (667) were planted at an average cost of \$31 per tree. The customers were responsible for planting the trees. The administrative costs were greatly reduced, \$4172, by limiting the number of trees for selection by the customers. The total cost of the project was \$142,000.

The Newark area was predominantly eucalyptus on a six-month trim cycle and the annual cost for trimming prior to the tree replacement project was approximately \$75,000.

I believe that focusing on long term goals and providing your personnel the appropriate tools to negotiate a tree replacement program will provide long-term benefits for most companies.

PG&E has developed a tree selection expert system to assist our personnel with their tree replacement programs. This computer program is one branch of artificial intelligence, containing a knowledge base of some 600 trees and a user interface. The program knowledge was gathered from the expertise of PG&E's Frank Chan who is well known in his field of horticulture.

Each tree in the data base has been rated in the following categories to determine an appropriateness indicator value: appropriate size, drought tolerance, aesthetics, availability, survival probability, messy fruit, prominent disease or pests, weak wood, and special pruning requirements. All trees are assigned an AIV ranging from 0 to 4, 0 being the least desirable.

When requesting an appropriate tree for planting, the program will ask for the following information: plant zone, soil pH, type of foliage, shape, sunlight exposure, soil moisture, soil texture, and height of tree desired. A recent enhancement to the program will pick the plant zone and appropriate soil pH by providing the name of the city closest to your planting site.

In addition to this a second program is being developed for our Customer Services Department. This data base will include medium to large trees which can be used for energy conservation. A toll free number will be available to our customers to assist them in proper tree selection. A well structured tree replacement program is one component of comprehensive vegetation management and when properly administered will pay dividends in the long term.

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## Abstract

DIRR, M.A. and A.E. RICHARDS. 1989. In search of the perfect Chinese elm. *Am. Nurseryman* 169(3):37-43, 46-49.

American nurserymen have selected superior forms of red maple, green ash and sugar maple. But until recently, they have neglected a most drought- and heat-resistant species—*Ulmus parvifolia* (Chinese elm, or lacebark elm). We can only find eight landscape cultivars that have been introduced and published. Thus there is plenty of room for improvement on what's out there now. We have distilled the following information on these cultivars from many sources to present a landscape perspective. We also present for the first time two selections from the University of Georgia. These selections will be available to the nurseryman next year.