UTILITY ARBORICULTURE AND URBAN REQUIREMENTS

by John W. Andresen

Abstract. One cause for contention and controversy between utility companies and property owners is the statutory removal of trees and the pruning of branches. Under natural and especially urban stresses many trees become hazards to life and limb. Broken branches and fallen trees can create power failure. Utilities have trained their line clearance personnel to preserve the integrity of trees within the utility right-of-way. But tree workers have to make critical decisions which may annoy or disturb the homeowner or tree advocate.

Résumé. Une cause de dispute et de controverse entre les compagnies de services publics et les propriétaires privés est l'abattage d'arbres et l'élagage de branches. Sous des stress naturels et surtout urbains, plusieurs arbres deviennent dangereux pour la vie des gens. Des branches qui cassent et des arbres qui tombent peuvent entraîner une panne d'électricité. Les compagnies ont donné une formation à leurs employés assignés au dégagement des lignes ieur permettant de préserver l'intégrité des arbres situés sous les emprises. Mais les arboriculteurs ont à prendre des décisions cruciales qui peuvent ennuyer ou déranger les propriétaires ou les défenseurs des arbres.

America's urbanized society demands a vast array of creature comforts. Our nation also requires open space, greened by trees and shrubs. Conflict, at times, occurs when our electrified world agitates the conservation and preservation of urban greenery.

Essential daily services needed to meet our expanding life style standards are provided by electrical energy. However, transmission and subsequent distribution of electricity often places restrictions upon tree growth and survival. The following describes how national and Illinois' utility companies and cooperatives can provide reliable electrical power while minimizing disturbance to tree form, growth and health.

Statistics by the Edison Electrical Institute indicated that, nationwide in 1987, total revenue gained by the electric utility industry was $160 billion (1). Of this amount, nearly $1.6 billion was invested in woody vegetation management. Further to the asset side of the national vegetation ledger, 57 million city-owned street trees had an estimated worth of $17 billion (5). These public values can be multiplied five to eightfold to gain the additional appraisal of private trees in urban areas. Trees under the influence of utility wires, both above and below ground, probably amount to 25 percent of those found in both the municipally and the privately owned urban forest.

Physical conditions of America's urban forest and its entwined utility dimension have been the subject of a number of recent articles (4, 7, 8, 9). Gary Moll of the American Forestry Association, discussed the condition of the city forests of 20 major metropolitan areas. In Chicago, Illinois he found that the number of trees as well as their vitality is declining at an alarming rate. His investigations revealed that for every eight municipal trees which were and are being removed, only one or two are being replaced. Further, replacement trees were not being chosen to be compatible with existing and proposed utility poles or conducting wires.

Remedies for this dendromalaise were provided in two subsequent articles by Moll (8, 9). He suggested that there are at least three possibilities for extending tree life. First is to improve the genetic quality and consequent survivability of the trees planted. Next is to upgrade the quality of trees purchased from contractual nurseries. And last is to refine the cultural practices which trees receive once they are planted on the street and under utility wires.

Utility forestry dimensions. Utility forestry is primarily concerned with trees as they are affected by electrical power transmission and distribution. Telephone and related electronic service as well as cable television instrumentation are also essential to our North American lifestyle. Physical associations of these three services and tree branches as well as roots often become complicated. Installation and maintenance of all three services include tortuous subsurface and overhead routes. These corridors often parallel one another and can occupy numerous elevational levels and directions. Cost-wise, transmitting plus distributing electrical service as well as telephone

and cable television transmission, is least expensive, at a ratio of one to eight when conducted through the wires of above-ground systems (10).

In most of Canada and the United States, electrical transmission along rights-of-way linking metropolitan and other urban areas implies high voltage currents of up to 765,000 volts. High voltage carriers can be visually recognized by their height and stature.

Vegetation management along these ranks of gargantuan towers connected by multiple, two-inch aluminum cables involves precisely regulated, managed greenspace. Management, in this case, emphasizes establishment and husbandry of low growing vegetative cover types. Powerline rights-of-way which traverse metropolitan areas can also include multi-purpose vegetation designs. On one hand, open land can support diverse populations of native grasses, shrubs and wildflowers as well as rented, vegetable garden plots. On the other hand, this dynamic land can also provide valuable songbird and wildlife habitat (3).

Management also involves precise tree pruning plus related silvicultural practices beneath the wires, and adjacent to designated rights-of-way. To avoid contact between vigorous woody vegetation and power lines, which would cause power outage, large trees are either pruned or removed.

Similar procedures to control vegetation are also practiced along low voltage distribution lines utilized at the backyard level. Power here is between the conventional 120 or 240 household voltage up to 34,000 volts for light industry. Union or juncture of this transmitting and distributing system can be recognized in the urbanscape by gravelled transformer yards where connections are made between 100-foot steel towers and 30-foot wooden poles.

At the Illinois stratum, with its 10 million people, electrical power company expenditures are about $2.6 billion. Of this, $54 million is budgeted for utility forestry and arboricultural practices (2).

Illinois utility companies have the legal, statutory obligation to prune trees, on either public or private property, which are adjacent to distribution wires. They also adjust vegetation within, or growing into distribution line corridors. These corridors, often separating property lots are usually 6 to 10 and up to 15 feet wide and are found in all Illinois communities. Jurisdiction to adjust tree growth on public or private property is authorized by the Illinois Public Utilities Act and other regulations assigned by the Illinois Commerce Commission.

Recommendations. Electrical service can be improved to the homeowner if new trees are selected and planted properly. Most utility customers are aware that carefully pruned trees are beneficial to the service user and to the providing utility. However few customers recognize the importance of locating and planting trees correctly.

Careful selection and planting is a prime, preventative technique to keep the branches out of utility wires once the trees mature. Wise woody plant selection also helps to ensure reliable electric service while enhancing the home environment. Small ornamental trees that require little maintenance are highly recommended by nurserymen for urban right-of-way planting. Regardless of which tree the homeowner selects, the following guidelines should be kept in mind:

- Large shrubs expected to reach 15 feet or less at maturity may be planted beneath utility wires;
- Small trees which will not exceed 30 feet at maturity may be planted 15 feet or more from the wires to allow adequate space for future growth:
- Medium trees that range between 30 and 70 feet in height at maturity should be planted at least 35 feet away from overhead lines for sufficient growth space; and
- Large trees expected to reach beyond 70 feet at maturity should not be planted within 45 feet of overhead wires.

Besides the consideration that should be given to overhead and underground electric lines, the homeowner should also avoid planting any shrubs or trees near padmounted electrical equipment. This includes air conditioner compressors, electrical terminals and transfer cases or cable TV connecting facilities.

Summary. The challenge of providing safe electrical power while maintaining attractive urban landscapes, can be achieved. We can blend mounting electrical demands of our growing urban

population with ecologically managed, adequately spaced greenery punctuated by shrubs and trees. Concerned citizens, responsive electrical utility organizations, municipal officials, and scientists are joining to create a further electrified community, well landscaped and vegetated.

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Emeritus Professor of
Urban Forestry
University of Illinois
Urbana, IL 61801

Abstract

CREECH, J.L. 1988. **Japanese pruning practices keep mature trees on the move.** Am. Nurseryman 166(12): 56-58.

With each journey to Japan, I have come to expect new experiences from Japanese nurserymen in their daily pursuits. One example is the Japanese's ability to use mature trees in landscape projects. This includes their ability to move entire plantings to accommodate new construction. Visitors often see new plantings with fully grown trees wrapped from base to stubbed branches with straw matting and heavily braced with wires or supported with poles. Rarely have I seen losses incurred in such major efforts. As a result, Japanese plantings quickly fulfill design concepts while, in our general practice, container-grown plants often take years to attain full status. These observations on the remarkable relationship between Japanese nurserymen and their plants emphasize the traditional way of the Japanese. In general, they closely control normal plant growth by careful application of the pruning shear and saw to shape specimens, and by continuous maintenance after establishment.