

THE WONDERFUL POWER OF SELECTIVITY TO POWER LINE RIGHTS OF WAY¹

by Charles J. Olenik

In recent years there has been an ever increasing demand by homeowners, business, and industry for more and more reliable electric service. To accommodate this increased use, companies such as Penelec have constructed new and higher voltage transmission and distribution lines to handle the increasing load. However, having the facilities to generate and carry the energy produced is only part of the aspect of providing reliable service to the customer. New and existing rights of way that are the "highways" of electrical energy must be maintained to prevent any interruption in the flow of energy. Specifically, interruptions caused by trees or brush reaching conductors thereby causing outages and other major and very costly problems.

At the present time, we as right of way managers have numerous synthetic growth hormones that do a reliable job in fighting the encroachment of undesirable tree species on our rights of way. However, we are also facing a fact of increasing public awareness in the areas of environmental quality, ecology, land use, and the value of an undisturbed natural landscape. This fact adds another dimension to the problem of right of way management. That is, we must maintain our rights of way to provide reliable service and at the same time manage these same areas so as to provide an aesthetically pleasing appearance and a land area useful for wildlife and recreation. The answer to this problem, therefore, cannot be just any chemical brush control program. There must be some thought and planning to choose a chemical technique that will provide adequate vegetation control and in addition be economical, safe, and aesthetically pleasing. To accomplish this goal we should consider some basic factors that are present on all rights of way:

This information must be gathered by a field survey of the right of way, which means we have to get out and walk and make some observations to determine:

1. Density of undesirable tree species.
2. Density of desirable vegetation.
3. Height of brush to be treated.
4. Terrain.
5. Access.
6. Agricultural activities in and near the right of way as well as State and Federal lands that cross the area to be treated.
7. Population.
8. Main road and highway crossing.
9. Stream and river crossings.

Gathering this information is a major part in making a final decision as to the type of chemical technique deemed necessary.

Consideration should be given to the techniques available and the advantages and disadvantages of each as they relate to the field survey. Some of the methods of application used on Pennsylvania Electric Company property over the years that have been proven effective are:

Selective Basal Application-Summer and Dormant Application

1. All woody plant species in the right of way, except species designated to be left for future ground cover, shall be treated with chemical in oil so as to saturate each stem completely at the ground line and to a height of 12 to 18 inches on the stem and completely encircling each stem. Where sprout growth originates from a stump, the treatment shall also be applied completely around the stump and any exposed roots.

2. Extreme care must be taken to treat only the tall growing tree species.

3. All chemical solution shall be applied by nozzle man walking the right of way. The applying equipment may be either power driven equipment or knapsack spray tanks. Spray nozzles shall be adjusted to produce a coarse spray of large droplets at 30 pounds or less pressure.

4. Treatment season shall be year around.

5. All evergreen plants, except those listed, shall be treated over their complete height, including all leaves, twigs, and stems, in addition to

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the basal treatment.

6. All stems of ash species over 5 feet in height shall be removed by completely cutting at the three-inch height. The brush from this mechanical cutting shall be disposed of in a manner acceptable to the property owner. No burning of this brush will be permitted without the approval of the company. Stumps of this brush to be treated in accordance with specifications for selective basal treatment except for height of treatment.

7. The following plants are not to be treated on the right of way:

- a. All grasses, ferns, and herbaceous plants
- b. All annual weeds and annual plants
- c. Low-growing shrubs including:

Mountain laurel
Sweetfern
Azalea
Huckleberries
Blackberry
Raspberry
Spice bush
Choke cherry
Choke berry
Dwarf willow
Witch hazel
American yew
Partridge berry
Wintergreen

- d. Small trees to be preserved on the right of way where conductor height will permit:

White flowering dogwood
Redbud
American hornbeam
Shadbush
Iron wood
Red cedar
Striped maple
American crabapple

8. All brush over 5 feet in height, except the above, located within 100 feet of all improved roads and highways shall be cut and stump treated. The cut brush shall be disposed of in a manner acceptable to the property owner and so as not to be visible from the road or highway.

Advantages

1. Selectivity in choosing stems to be treated.

2. Foliage "brown out" can be eliminated with dormant application.
3. Control over application of the chemical solution.
4. Can be applied year around.
5. Most acceptable to the public.

Disadvantages

1. Excessive cost when applied on dense brush.
2. Limitations by terrain and access.
3. May be a problem in obtaining oil.

Water-Borne, Stem-Foliage Application

1. All undesirable vegetative growth shall be sprayed with a solution of chemical and water so as to completely wet the entire leaf and stem surface until there is run-off; except that evergreen tree species over 5 feet in height shall be removed by cutting at the 3 inch height.

2. Extreme care must be exercised to insure that each plant is entirely covered with chemical solution, both on leaf and stem surface. To accomplish this complete coverage, it is necessary that the nozzleman treat each plant individually from a position close to the plant. Each plant must be treated from more than one direction.

3. All chemical material shall be applied by nozzle men walking the right of way. The nozzle opening size shall be #9 or larger. The nozzle pressure shall not exceed 150 pounds pressure. To assure complete coverage of plants on the outer edges of the right of way, it is necessary that they be sprayed by men walking to the edge of the right of way and directing their spray to the center of the right of way. Off right of way damage is not permitted.

4. Pump equipment used to pump or mix spray materials shall not be used to pump water from streams or ponds into spray tanks.

5. Chemical treatment is applied between June 1 and August 15.

6. Chemical treatment shall not be made when there is a danger of wind drift or spray materials causing off right of way damage.

7. Water-borne, stem-foliage treatment shall stop at least 100 feet from all road crossings, stream crossings, residences, and agricultural areas and the selective basal applications sub-

stituted.

8. All brush over 5 feet in height, except small trees and shrubs, located within 100 feet of all roads shall be cut and stump treated.

Advantages

1. Economical in dense brush.
2. Moderate to good control in dense stands of brush.

Disadvantages

1. Foliage "brown out."
2. Limitations by terrain and access.
3. Less selectivity in choosing stems to be treated.
4. Less control over application of chemical solution.
5. Limitations by weather conditions.
6. Limited time period of application.
7. Water supply may be a problem in some areas.

Application by Helicopter

1. Because of the complex nature of this job and the high degree of skill required in this operation, only qualified helicopter pilots with adequate experience in aerial right of way spraying shall be used.

2. It is necessary that all brush on the right of way be treated from two directions parallel with the line in order to overcome the shielding effect of the brush foliage on the forward motion of the spray droplets thus causing lack of treatment on the back side of the brush clumps. To accomplish treatment from two directions, one-half the prescribed volume of solution will be applied to the right of way by the helicopter flying in one direction; and one-half the volume will be applied by the helicopter flying the same swath in the reverse direction. The pilot shall exercise good judgment in applying the spray material to the brush. Where the density of brush varies on the rights of way, an effort shall be made to vary the application with the brush density. Side dressing of the trees along the edge of the right of way is not permitted. Damage to trees and other plants off the right of way will not be tolerated.

3. Each property owner on the right of way shall be contacted by the contractor's personnel to obtain consent for helicopter application.

4. Treatment shall be from June 1 and shall be completed before August 15. Application shall not be made when winds exceed 5 miles per hour.

5. Helicopter application shall stop at least 100 feet from all road crossings, stream crossings, residences, and agricultural areas and the selective basal application substituted.

6. All brush over 5 feet in height, except small trees and shrubs, located within 100 feet of all roads shall be cut and stump treated.

7. Selective cut areas shall be marked by the contractor so that they can be identified from the air and not treated.

Advantages

1. Economical
2. Effective kill on dense stands of tall brush.
3. Access and terrain aren't a problem.

Disadvantages

1. Foliage "brown out."
2. Less control application of chemical solution.
3. No selectivity of application.
4. Limitations by weather conditions.
5. Limited time period for application.
6. Disapproval by a larger portion of landowners than with other types of application.

With all the information on hand, a decision can be made so as to complement the conditions existing on the right of way with the proper chemical technique.

In some cases, several chemical techniques may be employed along a single right of way. This is especially true in Penelec's service area where power lines traverse diverse types of topography and land use areas.

As an example, during the 1975 spray year, one 500 KV right of way was treated using different chemical techniques. A right of way survey was completed the previous year and presented a situation where a selective basal application and helicopter application could be properly used along different sections of the right of way.

Approximately 270 acres were set up for the selective basal application because of the light to moderate density of brush intermixed with a

variety of desirable vegetation. Access to and along the right of way was adequate for men and power-driven equipment to accomplish their job with little difficulty. Finally, the areas surrounding the right of way were mainly crop lands and pasture areas. These existing conditions on the right of way dictated the selective basal approach.

Approximately 100 acres of the same right of way traversed remote, steep, mountain ridges and slopes supporting dominant, tall, stands of black birch (*Betula lenta*) and black locust (*Robinia pseudoacacia*). Access was limited with the population of the surrounding area being sparse. In this situation the helicopter application was a very useful and economical tool to be used without the public disapproval that may have occurred in a more populated or agricultural area.

By using this approach to vegetation

management on this particular right of way, as well as others, Penelec has achieved an effective control of tree species without the public disapproval that may result when we disregard all other factors and base an entire spray program on the economic aspect alone. Although economics enters the picture, other factors must be considered so that in years to come chemical brush control will not be government regulated or prevented all together.

Reference

1. Pennsylvania Electric Company. 1976. Herbicide treatment of rights-of-way. Johnstown, Pennsylvania.

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SHADE TREES—THE FRIENDS OF THE POOR AND OF THE CITY-DWELLER

by Francis W. Holmes

1. Public shade trees give even-handed, hard-working service to *everyone* who lives or visits in the community where they grow. They do not "know" who is rich and who is poor.

2. Shade trees *save fuel* in winter. They raise winds above houses, and thus slow the loss of heat. This can save 30% of the fuel cost for a house in open areas and 10% of the fuel cost even for a house in a city crowded with nearby buildings that break winds and leak heat.

3. Shade trees, by their shadows, *cool buildings* (especially attics and upper floors), also walks, roads, recreational areas, bus stops, parking lots, etc. They make summer heat tolerable where there is no air-conditioning machine. Yet when winter comes, the foliage falls

from deciduous trees, letting sunlight through to warm house roofs when they need warmth.

4. Shade trees in summer *cool the air* itself, since many calories of heat are used by evaporation of water from leaves during transpiration. This cooling is most effective in cities, where cooled air does not rapidly blow away. It is also most needed in cities, where fewer breezes cool our skins.

5. Shade trees *reduce glare*, which otherwise can be unbearable to the eyes, as well as harmful. In cities glare is multiplied by reflection from buildings and windows.

6. Shade trees and shrubs, especially evergreens, *absorb noise*. Intense noise (130 decibels, as in a jet plane takeoff) is painful; lower