# VEGETATION MANAGEMENT: MOWING TO SPRAYING

**by Richard A. Johnstone**

**Abstract.** Ten years ago, Delmarva Power began to change its vegetation maintenance techniques to control costs and improve wildlife habitat of its rights-of-way. Instead of periodically cutting vegetation with mechanical mowers, the Utility began to treat incompatible species of plants with herbicides. This not only resulted in lower right-of-way maintenance costs and improved wildlife habitat, but also improved aesthetics, accessibility, and environmental protection.

**Résumé.** Il y a dix ans, la compagnie Delmarva Power a commencé à changer ses techniques d'entretien de la végétation pour contrôler les coûts et améliorer les habitats fauniques dans ses servitudes. Au lieu de couper périodiquement la végétation avec des faucheuses mécaniques, la compagnie a commencé à traiter avec des herbicides les espèces de plantes incompatibles avec leurs réseaux. Cela n'a pas seulement résulté à des coûts bas dans l'entretien des servitudes et amélioré les habitat fauniques, mais aussi amélioré l'esthétique, l'accessibilité et la protection de l'environnement.

Vegetation on a electric utility rights-of-way must be maintained to provide access for work crews and to prevent trees from growing into the conductors where they could cause an interruption of electric service. Maintenance techniques vary from hand or mechanical cutting of brush, to treatment with herbicides. Delmarva Power's experience has shown herbicides to be the preferred technique to not only provide access and reliability needs, but also improved environmental stewardship.

Delmarva Power provides electric energy to a peninsula composed of the state of Delaware and the eastern shores of Maryland & Virginia. This relatively accessible coastal plain made it possible for mechanical mowers to periodically cut the vegetation growing on the utility's rights-of-way.

## Herbicide Test

Faced with inflating vegetation maintenance costs, and a desire to improve the wildlife habitat of its rights-of-way, Delmarva Power's Forestry Department began testing herbicides in 1980 as a means of controlling incompatible vegetation. The herbicide glyphosate (Roundup) was chosen because this product was used by area farmers and homeowners. It was felt that public acceptance of herbicide use would be much easier if the product was familiar to the customers.

The initial application was made in the fall so that color change of the treated brush might coincide with natural autumn color change. The following spring the treated area was found to have 90% control of the incompatible plant species. In their place ferns, grasses and wildflowers were now growing. These low growing desirable species were not noticeably present prior to herbicide treatment, but their spores and seeds were lying dormant in the soil. When competition for sunlight, water and growing space was eliminated, the desirable plants flourished.

## Mowing comparison

The herbicide treated areas were compared with similar right-of-way areas that had been mowed, and a vast difference in accessibility became apparent. The low-growing plant species composition of treated sites provided easy access for Utility vehicles, while mowed rights-of-way were occupied by tall, dense stems of incompatible tree

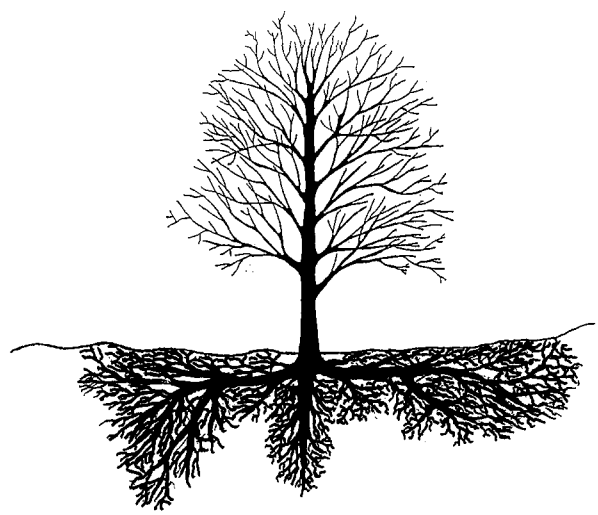

**Figure 1**

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

species. In some areas, incompatible vegetation seemed more dense than prior to mowing.

The reason for this difference is that mowing does not affect the plant's root system. A typical tree has a root system at least as large as its crown (Fig. 1). When the top is cut off (Fig. 2) the food stored in the root system will feed numerous sprouts from the cut stem (Fig. 3). One incompatible stem can produce 10 to 15 of these sprouts when cut. This problem is further compounded if a root suckering species like sassafras, black locust or cottonwood is cut. These plants will sprout profusely wherever their root system is near the soil surface. One of these root systems can produce 100 incompatible stems the next growing season, following mowing or handcutting (Fig. 4).

**Five Reasons for Herbicides**

After comparing these two maintenance techniques it was determined that herbicide treatment was preferred for several reasons.

First, proper herbicide application is safer for workers to perform than is cutting. Testing has shown that these products are safe to workers because of their low mammalian toxicity and are safe to the environment, with some glyhosate registrations allowing treatment directly into water. Public safety is also protected since the spray foreman is a certified applicator well versed in the product's use and application, and is trained in tree identification. In contrast, mechanical mowers can throw projectiles at the workers and handcutting with chainsaws and brushaxes is a risky occupation.

Second, herbicide use improves right-of-way aesthetics. The treatment of incompatible plants with herbicides allows more desirable species such as ferns and wildflowers to flourish. This diversity of color and texture has resulted in customer praise for the beautification of roadsides, and is aesthetically more pleasing than a mass of tree sprouts.

Environmental protection can be achieved with the proper use of herbicides. When incompatible vegetation is treated, the remaining low growing plants protect soils from the forces of erosion and buffer streams from siltation. Mechanical mowers non-selectively cut all vegetation within the right-of-way.

Excellent wildlife habitat can be developed through the judicious use of herbicides. Initial herbicide treatment removes the incompatible trees and permits grasses, ferns and wildflowers to grow on the site. Subsequent selective herbicide treatment allows for natural plant succession to herb, grass and shrub species. Continued touch up treatments maintain this plant succession stage at the herb, grass and shrub stage and provide wildlife cover and a mozaic of seed and berry producing plants. Mowed brush can only temporarily provide browse and cover for a limited number of animal species in the form of sprout regrowth. This food and cover, though, is repeatedly destroyed by the mechanical mowing operation (1).

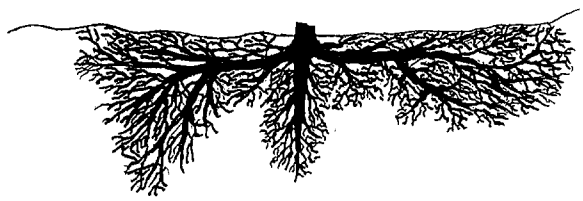

**Figure 2**

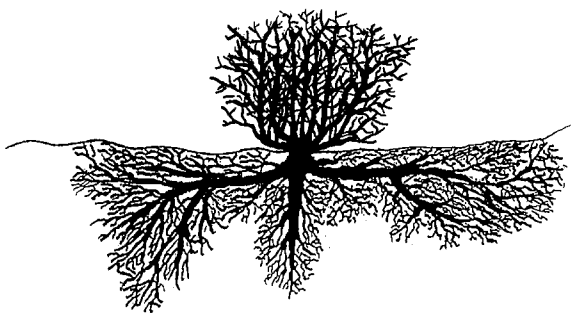

**Figure 3**

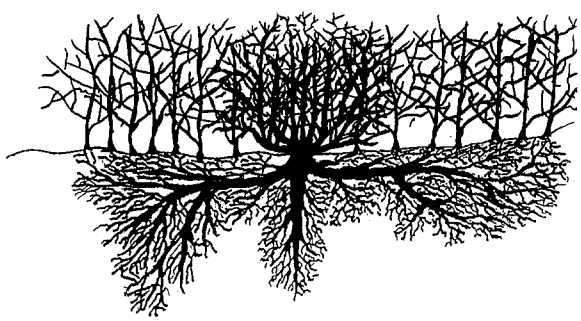

**Figure 4**

**Manhours.** The economic benefits of herbicide treatment are evident in both labor and dollar comparisons with mowing. Figure 5 compares manhours for the two maintenance types. Labor requirements for herbicide treatment vary depending on location of brush, access on to the right-of-way, height and density of the brush, and equipment used. Delmarva has experienced decreased labor requirements ranging from 12 man-hours per acre, when knowledge of rights-of-way conditions were vague, to the present average of 2½ man-hours per acre, where more prescribed methods are applied to the various conditions.

Mechanical mowing of three-year old brush averaged 9-10 man-hours per acre for work contracted on a time and material basis. When knowledge of rights-of-way conditions were known, fixed price bidding was used to reduce labor to 7 manhours per acre.

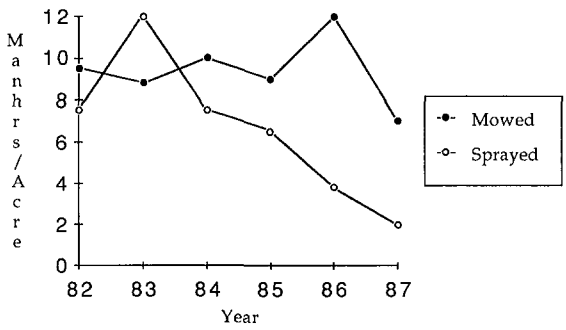


**Figure 5. Transmission spray productivity**

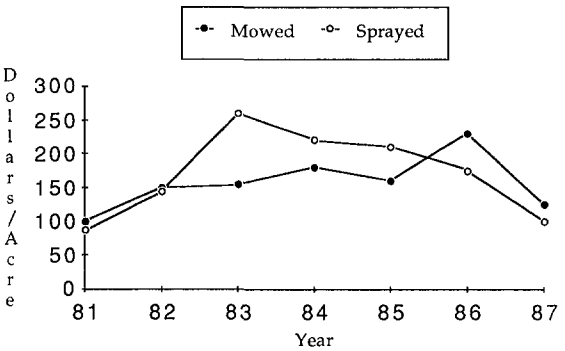


**Figure 6. Transmission cost per acre**

**Cost per Acre.** Figure 6 compares the two techniques on cost per acre. Herbicide treatment went from a high of $260 per acre to the present average of $100 per acre, due to better planning and reduced brush density. Mechanical mowing of one-year-old brush cost $80 per acre in 1980 and jumped to $150 per acre for three-year-old brush. It continued to escalate until the fixed price mowing reduced costs in 1987.

**Ten year budget.** The effect of all this on Delmarva's maintenance budget is outlined in Figure 7. The herbicide treatment (sprayed) line illustrates actual expenditures for vegetation maintenance over a ten-year period. The mowed line starts with the proposed 1980 budget for mechanical mowing on a 1-2 year cycle and projects out ten years based on annual cost-of-living increases. The integration of herbicides into Delmarva's right-of-way maintenance program saved the utility over $1,000,000 during this ten-

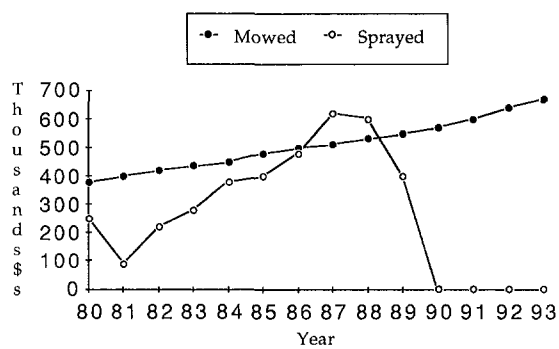


**Figure 7. Transmission vegetation maintenance budget**

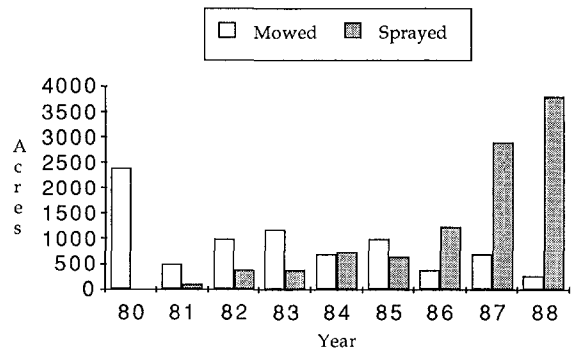


**Figure 8. Transmission vegetation maintenance**

year period.

Figure 8 explains the number of acres maintained by each method throughout this period.

**Environmental Partners**

Delmarva's knowledge of integrated herbicide use has made it possible for the utility to assist in the management of vegetation on lands owned by environmental organizations. The Nature Conservancy and the Delaware Nature Society have sent Delmarva Power thank you letters for treating exotic plant species in unique ecological areas. A tour of herbicide-managed sites prompted this comment from Chesapeake Wildlife Heritage biologists Robin Haggie and Dana Arnold: "We believe you have tackled the problem of vegetative control in your rights-of-way in an environmentally sensitive manner and certainly have enabled a great species diversity to colonize with judicious use of herbicides."

**Summary**

The integrated use of herbicides allows Delmarva Power to manage its electric service reliability and right-of-way access needs in a more efficient, economical and environmentally sensitive manner. In addition, we have improved the aesthetics and wildlife habitat within our service territory, and demonstrated that we can provide the energy needs of our customers while being good stewards of the land we all share.

**Literature Cited**

1. Bramble, W.C. and Byrnes, W.R. 1982. Development of wildlife food on an electric transmission right-of-way maintained by herbicides: a 30 year report. Department of Forestry and Natural Resources. Purdue University, RB974.

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## ABSTRACT

SHURTLEFF, MALCOLM C. 1989. **Diagnosing shrub diseases.** Grounds Maintenance 24(7):18, 22, 26.

Correct diagnosis is the first and most important step in the treatment of any disease. Base your disease control programs for shrubs on a thorough knowledge of the diseases that are likely to appear in your area, the plants that are susceptible to attack and an early and accurate diagnosis of the problem. You must start control measures before or at the early onset of the disease, but preferably before symptoms appear. First examine the leaves, and then progress to the young shoots, branches and main stem(s). Finally, check the crown and roots. Leaves are the best indicators of shrub health. By inspecting them, you can tell whether the plant is vigorous or declining. Wilting is due to a temporary or permanent deficiency of water in the leaves, shoots or fruit. Girdling cankers are usually oval or elongated with discolored wood beneath the bark. Galls in twigs, branches, main stem or crown may be caused by a number of factors, including insects, bacteria and fungi. Severely cold weather or sharply fluctuating winter temperatures may kill individual twigs, branches or entire shurbs. Root problems are usually difficult to diagnose. Many times the culprit is two or more factors working together.