



The Herbicide Market

UTILITY WEED CONTROL

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THE U. S. Departments of Agriculture and Interior in their publication, "Environmental Criteria for Electric Transmission Systems," estimated there were 300,000 miles of overhead electric transmission lines representing nearly 4 million acres of rights-of-way in 1970.

By 1990 it is estimated another 3 million acres of right-of-way will be required. Vegetation manipulation on these rights-of-way will provide the utility arborist and custom applicator diverse opportunities to apply their technical skills and practical know how.

Utilities are increasingly facing a dilemma. On one hand they are mandated to provide dependable, economical electric service and are highly regulated by state and Federal agencies. On the other is the necessity to provide this service within current environmental considerations with a minimum intru-

sion on the landscape and biosphere. Compounding the problem is the responsibility to meet all these demands without increased costs, if possible, or contributing to the energy crisis.

Substations, transmission lines and power plants have become a focal point for action and criticism in responding to the national concern for protecting the environment. People protest the construction and operation of these facilities in their neighborhood, but no one wants to be without electricity.

After electric service reliability, engineering, environmental and economic considerations have been satisfied, then multiple land use, conservation, wildlife use, landscape and other aspects must be considered in designing, constructing, maintaining and operating transmission lines, power plants and substations. Utilities employ arborists, landscape architects and horticulturists. They perform extensive plantings of trees and shrubs to improve the appearance of their facilities and design them for minimum intrusion on the

environment.

Trees and brush must be prevented from contacting overhead electric conductors. The higher the voltage the greater the necessity for adequate tree and brush clearance. A town could be blacked out by an interruption to a 69,000 volt line, while an entire city could be affected by an interruption on a 345,000-volt line.

Ground and aerial spraying of herbicides has been the principal vegetation control technique used to eliminate or manipulate woody vegetation on these lines. No one chemical, technique, application or unit of equipment will satisfy all vegetation control requirements. The utility arborist and custom applicator must have sufficient technical skill to recognize and utilize the optimum tool for each situation.

Among the herbicides most frequently used for woody brush control are 2,4-D, 2,4,5-T, Tordon, Banvel Ammate, Tandex, Hyvar, and 2,4,5-TP. These are chemically formulated for use with water, oil or as thickened emulsions.

Aerial spraying with helicopters does the majority of work in mountainous and inaccessible terrain. For efficiency, economy of operation, speed and effectiveness, absolutely nothing can approach this method in these situations. Thickened (invert emulsions) formulations and special spray application equipment to prevent these materials from drifting off the R/W application area have been developed by the chemical companies. A helicopter using these special formulations and application equipment can fly above a transmission line and precisely apply the material without spray drift damage to adjacent vegetation.

Stem foliage sprays applied at concentrations of one to two gallons of herbicides per 100 gallons of water is the most common method. Four wheel drive equipment with a 400 to 800 gallon hydraulic sprayer is driven over the right of way.

Usually spraymen with individual hand spray guns cover the entire plant from top to bottom to the point of run off with the herbicide mixture. Another variation is the use of an OCS nozzle to apply the herbicide mixture as a broadcast spray 33 feet either side of the truck. Here the truck is driven down the R/W at a fixed speed while the spray mix passes through the OCS nozzle.

Light weight high-pressure nylon spray hose has substantially decreased the physical effort and in-

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creased the productivity of sprayers in those areas where they must resort to dragging hose. One thousand feet of this hose nylon weighs less than 100 feet of conventional high pressure rubber spray hose.

Equipment used has progressed from surplus four wheel drive army trucks to Bombardiers — tracked vehicles especially designed for use in muskeg and swamp — to Timberjacks — rubber tired, articulated, heavy duty vehicles developed for skidding logs out of the woods.

A Timberjack sprayer with a 800 gallon tank basal sprayed 593 brush acres at a cost of under \$70 per acre, and stem foliage sprayed 734 brush acres at a cost of under \$55 per acre. These costs are 30 to 40 percent less than using conventional four wheel drive spray equipment. The \$26,000 acquisition cost limits the number of these machines available.

Another variation of stem foliage spray is the use of back power units (gas engine driven mist blowers). The herbicide concentration is increased up to eight times normal

and the air blast from the machine is the carrier used to apply the concentrated mix. Both stem foliage spray and basal can be applied with this equipment. Advantages of this equipment are the small investment required and the ease of operation in difficult terrain. Carrying this 30 to 40 lb. weight around on their back all day while struggling through the brush is a limitation.

Basal spraying with 2,4-D or 2,4,5-T and fuel oil during the dormant season has been extensively performed to control hard to kill species (ash, oak, hickory) and for selective applications.

Another challenge facing the chemical company, utility arborists and custom applicator is the necessity for developing an environmentally acceptable, economical substitute for fuel oil in basal spraying that can be used in the dormant season. With the energy crisis and fuel oil shortage, utilities realize they cannot spray herbicide fuel oil mixtures on brush when homes are cold and factories may be curtailing operations due to shortages. Hyvar and Tandex mixed with water at rates of one-fourth to

one-half pound per gallon and applied at the base of the plant offers the most promise at the present time. However, both these materials are residual type chemicals which are subject to lateral movement off the R/W under some conditions and must be utilized with caution adjacent to sensitive or desirable vegetation. Also, the water herbicide mixture freezes in cold weather.

Hydraulic sprayers, back pack power units and back tanks all have been used to apply the herbicide fuel oil mixture to the basal 12 inches to 36 inches of the plant. It is important to get coverage completely around the stem to ensure complete kill.

Selective basal spray is used to remove tall growing species of woody plants on the R/W without disturbing the low growing species of shrubs, weeds and other desirable vegetation. First and foremost, there must be a combination of species adaptable to selective manipulation. Selective basal spray has been widely advocated and endorsed by the environmentalist as

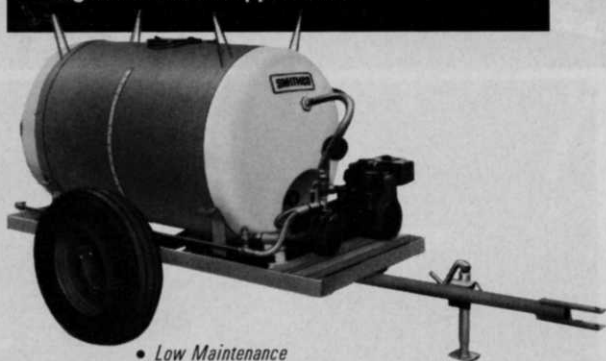
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the acceptable technique In areas such as upstate New York, it was relatively easy to use this technique on the combination species of vegetation in the Catskill Mountains.

It is much more difficult to apply this selective basal technique to those species of vegetation growing on the hills of southern Ohio. The lack of low growing species of shrubs and rapid regrowth rate of undesirable species severely limit the areas adaptable to this technique Essential to a good basal program are workmen instructed in plant identification working under close supervision.

Granular or pelleted materials containing Tordon, Tandex, Hyvar or Dybar are available for placement in the root zone area of the undesirable plant. Moisture dissolves the pellets and carries the chemical into the root zone where it affects the plants.

My twenty one years of spraying utility R/W's has produced innumerable changes in attitudes, requirements, chemicals and results.



This gigantic brush chopper built by National Hydro-Ax can clear brush at a cost of about \$64 per acre. This compares favorably with other methods of brush control along utility rights-of-ways.

In 1953 a desirable R/W was one with all the brush eliminated and grass as a ground cover. Brush was sprayed in deep hollows where conductors were high above the mature height of the trees, to provide access for men and equipment in case

maintenance was necessary. Today a satisfactory R/W may be covered with brush which does not interfere with the maintenance and operation of the line.

Years ago if a herbicide did not
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Growth Control on Trees. Slo-Gro inhibits tree growth by stopping the terminal growth of woody plants. Primary applications include control of tree size under power lines, along streets, or wherever excessive foliage is a problem.

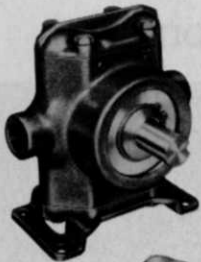


Golf Course Maintenance. While Slo-Gro is not recommended for general use on fine grass areas such as residential or commercial lawns, it has been used extensively on golf course roughs. It can also be used in conjunction with herbicides wherever weed control is required.

Hypro Pumps

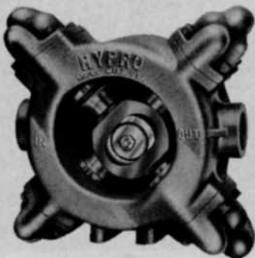
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completely kill a plant it was unacceptable. Today if the herbicide will only partially kill or retard the growth of the brush, as long as it never grows into the wires, this is acceptable. A helicopter application of herbicide that only partially kills the brush is the most economical and practical means to prevent tree-wire contact in mountainous and inaccessible terrain. Additionally the partial kill reduces the possibility of erosion developing.

Research and development is being carried out on the use of helicopters to apply growth inhibitor chemicals aerially to retard the regrowth of brush without any elimination of plant material.

Mechanical or manual reclearing of brush on R/W's has increased in volume and importance particularly in the urban/suburban areas and because of property owner refusal to allow herbicide spraying. The public will not tolerate the brown-out associated with stem foliage spray in developed areas. Additionally adjacent home owners will object if the R/W does not have an acceptable appearance adjacent to their manicured lawns.

Equipment for mowing and reclearing varies from rubber tired farm and industrial tractors with rotary or flail mowers to large, articulated, rubber tired, construction machines capable of cutting an 8-inch (DBH) softwood. Recently we used a Hydro-axe to reclear spray refusals throughout a five county area. Brush up to 15' or more tall was recleared on 148 brush acres for less than \$65.

Another tool which we have tried is the brush chopper roller. This has sharpened blades around the circumference of a large diameter weighted roller. A bulldozer is used to pull the roller. This machine recleared 121 brush acres for less than \$70 per acre. One drawback is the difficulty in transporting equipment between work locations due to the size and weight involved.

Landscape planting of trees and shrubs is being selectively performed around substations to enhance their appearance and reduce the impact of these facilities. Mowing of grass, insect and disease control, pruning and fertilizing all provide additional opportunities for the products and talents of the Green Industry. Ohio Power Co. has landscaped 23 buildings, 76 substations, and 2 power plants since 1966. This gives some

indication of the scope of work being performed.

Weed control to reduce the fire hazards in the gravel areas around substations, power plants, coal piles, etc. using residual type herbicides is another area of operation for the custom applicator. Ohio Power Co. practices weed control on 493 acres around the state. Landscape plantings adjacent to these gravel areas will be injured if the herbicide used moves laterally. Consequently materials that will not affect woody vegetation or established lawns must be used in those areas.

Seeding of disturbed ground on newly constructed transmission lines, to prevent erosion and reduce the regrowth of brush is another area for the Green Industry to provide a service for the utility. Approximately 158 acres of R/W were seeded by Ohio Power Co. in 1973. A new innovation being evaluated is the application of seed and fertilizer by helicopter to disturbed and undisturbed ground on R/W's.

What do I see as the future of electric utility vegetation management? Currently, it is estimated that electric utilities spend approximately \$40-50 million on herbicide application, \$10 million on reclearing and mowing transmission R/W's, and \$15 million on landscaping and maintenance. This volume of work will increase at a steady 5 to 15 percent as new facilities and lines are constructed.

Diversity of requirements, objectives, techniques, chemicals and methods will test the technical and practical skills of all concerned to comply with regulatory, environmental and aesthetic demands.

Aesthetic considerations will become more significant with selective clearing, selective spraying, retention of trees and shrubs at R/W road crossings, reseeding R/W's for wildlife utilization and multiple R/W use all being practiced to a greater extent.

Landscaping and associated aesthetic improvements will increase in volume and sophistication. Design, construction and maintenance will provide more opportunities for the green industry.

Vegetation control by herbicide application will not increase by the same magnitude as other operations. More spraying will be selective, greater emphasis will be on multiple use. With current farm prices increased acreages will be put into agricultural production by bulldozing out the stumps and brush.