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GOVERNMENT UPDATE

Payroll changes take effect this month

The wage base for Social Security and the Minimum Wage increase this month. Minimum wage is now $3.10 per hour and the wage base for Social Security has risen to $25,900 from $22,900. Check with your payroll people to assure compliance.

Benomyl gets conditional approval

Benomyl made it through Rebuttable Presumption Against Registration with two additional conditions; that a cloth face mask be worn during mixing and that large volume users mixing five or more lbs. at a time must be provided the product in water soluble bags. The valuable fungicide sold as Benlate, is manufactured by E.I. du-Pont de Nemours & Co.

Occidental fights groundwater dispute

The Lathrop, CA, facility of Occidental Chemical Co., a subsidiary of Hooker Chemical, has been named in a suit by the California attorney general for contamination of groundwater as a result of waste disposal practices.

Hooker President Donald Baeder denies any wrongdoing and promises to resist the "unwarranted" suit. No injury has been traced to the Occidental plant where DBCP was once made.

EPA grants to help urban lakes

Ten grants of $100,000 are being awarded to U.S. cities as pilot projects in an urban clean lakes program. EPA estimates that there are another 3,700 urban lakes which need help to avoid further deterioration. Decaying algae and aquatic plants are major targets of the program.

The target projects are:
Spy Pond, Arlington, MA
Weequahic Lake, Newark NJ
Lake Roland, Baltimore, MD
Lake Maggiore, St. Petersburg, FL
Park Lagoons, Milwaukee County, WI
Lake Pine Bluff, Pine Bluff, AR
Forest Park Lakes, St. Louis, MO
Sloans Lake, Denver, CO
Lake Merritt, Oakland, CA
Green Lake, Seattle, WA

Park air quality subject of enforcement

EPA has promised to crack down on air pollution sources which hinder use and enjoyment of parks and wilderness areas. Any source of air pollution near national parks of 5,000 acres or more should check ways to comply and avoid prosecution by EPA.

EPA calls for industry to induce own cleanup

The EPA has issued a "bubble" policy which should help industry cut costs by allowing it to figure out the best way to clean up air pollution at individual plants. Overall clean air requirements must still be met.

EPA Administrator Douglas M. Costle predicted that "This new, flexible approach to regulation will both stimulate the discovery of new control techniques and reduce the cost of regulation substantially. In the long run, both these results are critical environmentally."

PLANTS

Researcher recommends plastic for cold plants

A University of Maryland scientist believes nurserymen should roll out the plastic carpet if they want to make life easier for their plants during winter.

Dr. Francis R. Gouin, professor of horticulture, thinks the best way to pamper container-grown plants and prevent their delicate roots from being ravaged by frigid temperatures is to bed them down in a snug thermo-blanket of synthetic polyethylene or polypropylene.

The process, which results in substantial energy and money savings for commercial plant growers, is much more effective than and only a fourth the cost of conventional techniques.

Dr. Gouin has pioneered the use of foam plastics (commonly used in packaging and shipping furniture) to prevent winter injury to container-grown ornamental plants. He has spent the last 15 years studying winter hardiness of ornamental plants and a decade ago came up with the notion of insulating them in a plastic blanket.

Dr. Gouin inadvertently learned of the insulation value of microfoam, a polypropylene packaging substance manufactured by Du Pont De Nemours & Co., when he wrapped some ice cubes in it one day and forgot about it. Hours later, he found surprisingly little had melted. Gouin estimates that the use of the plastic packaging foam, which costs about 4 cents a square foot, results in wintering cost of about 6 cents a plant as opposed to about 25 cents a plant using conventional approaches.

PARKS

Volunteers can help Ohio directors told

Volunteers in the Hamilton County Park District (Cincinnati, OH) have learned about all aspects of park maintenance and functions and contributed a tremendous amount of help to the park system.

Continues on page 50

An EXCEL HUSTLER mower out-hustles any out-front mower any time, any place.

And does it mow! EXCEL HUSTLER 275, 285, or new 295 cuts the straightaway down to size with a smooth, even cut, up to 6' swaths.

But where the EXCEL HUSTLER really shines is turning neatly around every bush and tree, signpost and picnic table. With every turn, operators turn into fans of its drive-wheel steering and fingertip control.

Does more than mow. Team an EXCEL HUSTLER tractor with attachments and it works all year long. Cuts all kinds of grass. Cleans dirt, litter, sand, leaves, etc. from walks and parkings. And what it does to snow is enough to warm a groundskeeper's heart!

The tractor is the core of EXCEL HUSTLER performance. Dual hydrostatic drive directs power independently to drive wheels, controlling both speed and direction of travel. Because one wheel can move forward while its mate reverses, the operator can turn a full 360° circle within the mower's own length! No steering wheel can match the response of twin hand levers, nor even approach their ease of operation.

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Our biggest offers you the MOST.

If your underground requirements are tough ones, take a look at the most Ditch Witch has to offer—the R100 Modularmatic unit—the most rugged, high-performance piece of 100-HP-class equipment available. Rough terrain or cross-country work, the R100 can handle it.

An exclusive frame-tilt feature lets you trench vertically on side slopes. Its rubber tires let you maneuver around the work site with little or no damage to surface areas. And four-wheel steering puts you into position easily.

The R100's front-mounted, six-way hydraulic blade makes backfilling or site clearance routine. Lock on an optional vibratory plow module and you can plow-in cable, tubing or plastic pipe.

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When your underground work falls into the light construction category, the least from Ditch Witch—the C77 handlebar trencher—offers the most work capability within its class.

The standard 20,000-pound-test digging chain on the C77, our smallest model, is comparable to that of larger trenchers. The controls are marked for quick identification and are located within easy reach of the operator.

A rugged 7-HP engine allows the C77 to take hours of tough use. Its compact size permits maneuvering through yard gates and around the tightest job sites. And loading is a one-person operation.

The MOST in little plows too.

When your smallest plowing requirements create the most problems, turn to the least from Ditch Witch—The VP12 vibratory plow—to clear that 36-inch backyard gate and get on with the job.

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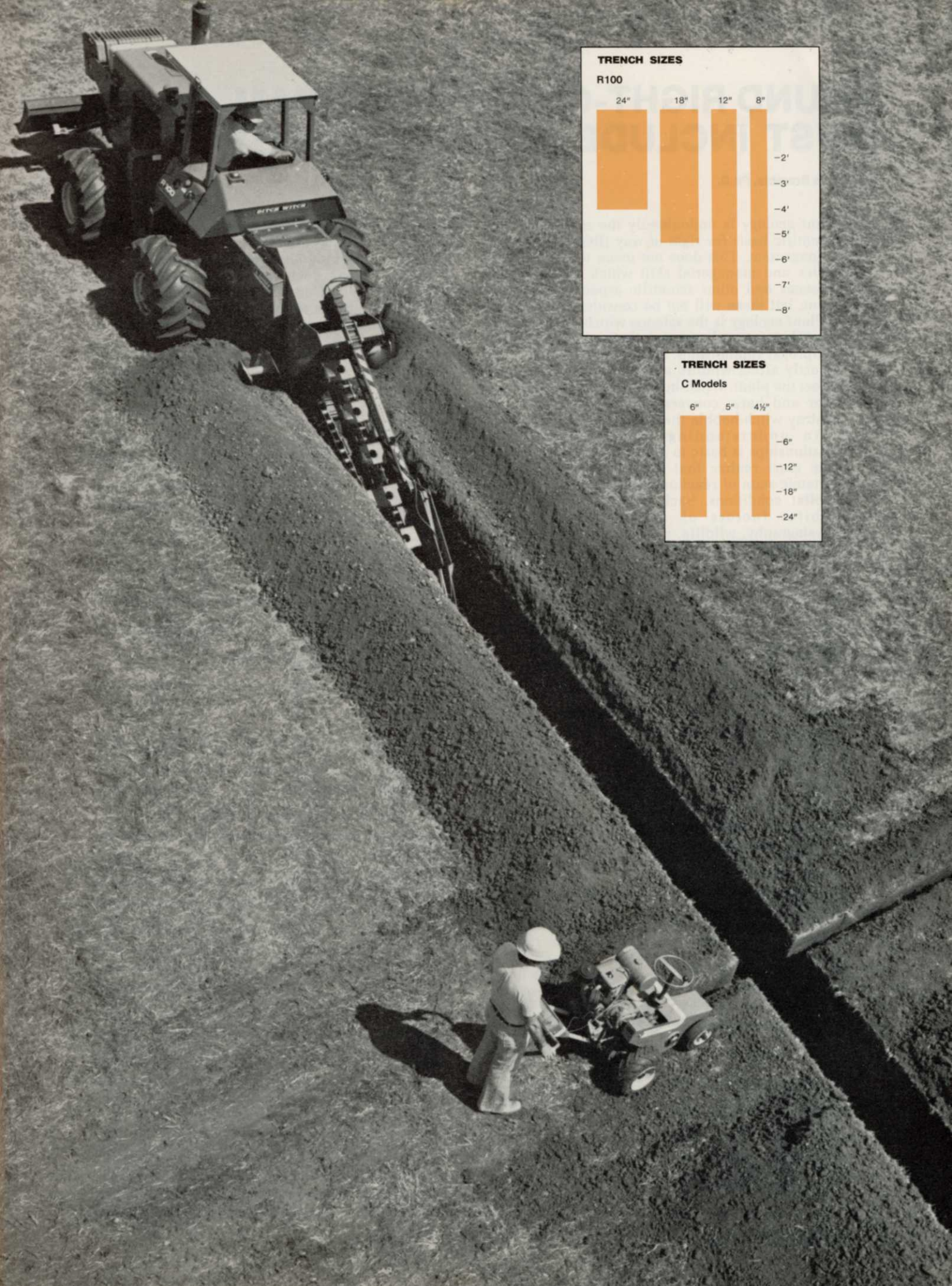
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–6'
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–6"
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–24"

SOUND RIGHT-OF-WAY PROGRAM MUST INCLUDE PLANT ECOLOGY

By William Bramble, Ph.D.

Plant ecology is undoubtedly the most important scientific basis for right-of-way (ROW) vegetation management. This does not mean to ignore economics and managerial skill which involve social sciences and other scientific aspects of management, but these will not be considered here.

Plant ecology is the science which treats of relations between plants and their environment—a reciprocal relationship. For example, a plant may directly affect wildlife and wildlife may, in turn, affect the plant. Witch-hobble may furnish food for deer and hare; conversely, deer and hare may destroy witch-hobble through excessive browsing.

An understanding of these ecological relationships is basic to sound ROW management. One must realize that ROW vegetation is in a dynamic state of reaction and adjustment to ROW habitat conditions. Such conditions include the habitat factors of climate, water, soil, physiography, wildlife, man, and other plants, all which makes for a complicated situation on ROWs.

To simplify and make something useful and understandable out of the complex ROW situation is the most difficult task in application of ecology to management. Often to help in this task, the use of the theory of limiting factors is employed to explain cause and effect. For example, animal destruction of weeds has been used to explain why trees do not reproduce in a scrub oak community. When this one factor was controlled, pine was established. In such a community on a ROW, a thriving small mammal population could be a limiting factor of value.

In another case, allelopathy was used to explain why black cherry did not reproduce on certain sites on the Allegheny Plateau where open orchard-like stands have persisted for 50 years without burning. Allelopathy refers to a release of biochemicals (phenolic compounds) into the environment by certain plants which has an inhibitory effect on the growth of neighboring plants. It was long held that heavy browsing by deer and hare, frosts, and herbaceous competition were the cause.

Now it is being suggested that allelopathic effect of dominant goldenrod, grass, aster, and fern is the chief limiting factor. Some of the common ROW plants which have exhibited this effect include: hayscented fern, New York fern, short huskgrass, ground pine, bracken fern, wild oat grass, goldenrod, aster elderberry and blackberry. Even the mosaic pattern of vegetation so typical of ROWs may be a result of allelopathy.

Another useful application of plant ecology is to recognize plant communities on ROWs which reflect the end effect of complex habitat factors. Plant communities are not distributed at random. When a plant species invades a ROW it becomes subject to habitat conditions which exist there and which determine its survival. Those species that survive form a plant community. To be useful in ROW management, plant communities would be easily recognizable at any season of the year (plant sociology blick). Fidelity, constancy, and cover value (dominance) are used to select characteristic species of a community. Where species distribution and grouping have not been previously described for a region, a preliminary group of characteristic species and communities may be recognized. These can be refined by later studies.

Chemicals released by certain plants may inhibit the growth of neighboring plants.

When using plant communities, the floristic composition is the primary criterion, with habitat and stage in plant succession not used to delimit a community. The characteristic species are considered to be the best indicators of a habitat. They also do reflect succesional trends when communities are arranged in order of their complexity from grassland to forest.

One of the leading tenets in an ecological approach to ROW management is the stability of shrub communities. The concept is that pure shrub patches on ROWs, once established and trees removed from them, are stable and resist tree invasion. Careful examination of this concept shows it to be true, although there are some exceptions. Many shrub patches of such species as blackberry and sweetfern are readily invaded by trees. However, pure patches of low blueberry on a ROW have been stable for at least 25 years where selective spraying has been used to remove capable trees. That utilities use such information is shown by the increase in selective spraying over the Penelec system and exclusive use of selective capable tree control by Metropolitan Edison.

Where shrub communities have persisted for many years, such as in scrub oak barrens, there is always a reason, usually a limiting factor or factors. In the case of a scrub oak barrens, fire and wildlife destruction of tree seedlings have been limiting factors. These have now been removed and the

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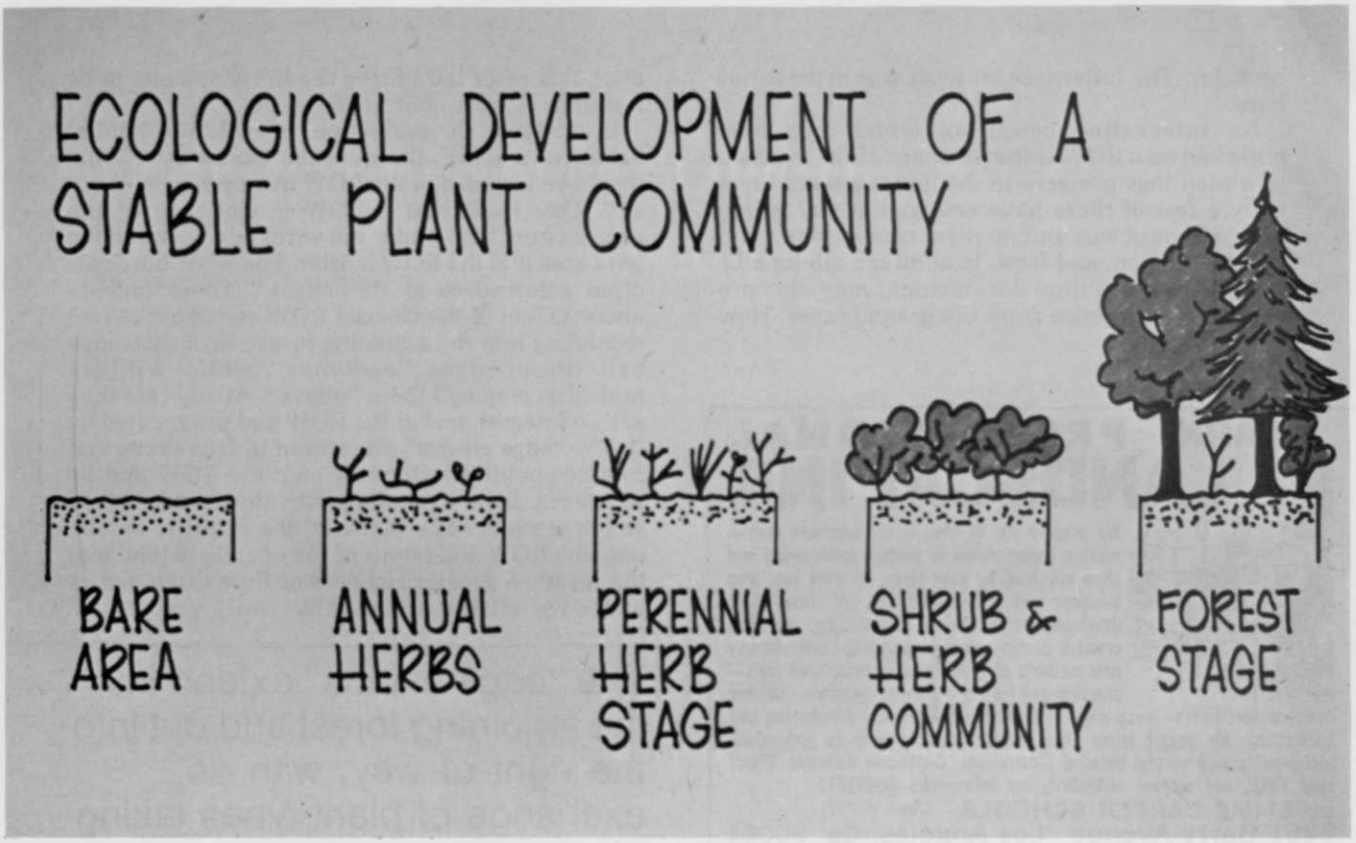
Dr. William Bramble is Professor Emeritus of Forestry, Purdue University, West Lafayette, IN. For more than 25 years Dr. Bramble has performed research, served as a consultant to public agencies, and presented papers on the environmental impact of right-of-way management techniques. Dr. Bramble's paper was suggested to Weeds Trees & Turf by Hyland Johns, senior vice president, Asplundh, and presented originally at a recent major ROW conference. **WTT**



scrub oak is gradually changing to a forest with a scrub oak understory.

The sequence of events which takes place after a ROW is cleared through a forest has some very interesting ecological aspects which are also a key to what occurs on older ROWs.

In some cases, there is a sudden development of species typical of open areas not common in the forest. Blackberry has sprung up as if by magic following clearing of northern hardwoods, and this has been directly related to seeds deposited in the forest floor by birds. Many thousands of seeds have been deposited per hectare each year where they remain dormant and viable. Pin cherry has also exhibited a similar invasion and rapid development following forest clearing. It is no wonder then that ROW managers have experienced similar development of such plants following construction.

Under other circumstances, where an upland oak forest has been cleared the opposite has occurred. Plants common in the forest shrub and herb layers have developed after clearing to dominate the ROW for 25 years. They are the sole dominants for about five years. Subsequently, after about 10 years, plants of openings and open areas develop to become part of the dominant cover. They were probably present in the forest in small numbers and invaded disturbed areas on the ROW after clearance. This has produced the typical mixture of species found on older ROWs where plants of the former forest mingle with plants of open areas. The complex mixture is in a state of suspended plant succession by removal of capable trees in ROW maintenance.

This has been described as a combination of "relay foriatics" and "initial floristic composition"

Black cherry emerging from sweet fern in right-of-way.

by Egler. The latter means: what was there is now here.

An interesting condition which has been observed on a ROW is the presence of thousands of tree seedlings per acre in the dense ground layer. Only a few of these have emerged at any certain time and most succumb to plant competition, wildlife destruction, and frost. In addition, allelopathic inhibition of seedling development may also prevent tree emergence from the ground layer. However, this reservoir of tree seedlings appears to be a source of trees that need control.

In making an evaluation of wildlife habitat values of a ROW, the question comes up: "What should be included in the ROW in an ecological sense?" One finds that a ROW is made up of the cleared area both under the wires and between the wire area and the ROW border. The ROW border is often referred to as its "edges." These include about 33 feet of the cleared ROW and about 33 feet extending into the adjoining forest. Ecologists may call these edges "ecotones" while wildlife biologists may call them "edges." At any rate they are an integral part of the ROW and are created by it. The "edge effects" are caused by tree shade and root competition extending onto the ROW and by increased light extending into the forest, all of which permits some plants of the forest to extend onto the ROW and plants of the open to extend into the forest. A greater richness of flora often occurs and edge effects are usually easily recognized.

The "edge effects" extend into the adjoining forest and out into the right-of-way, with an exchange of plant types taking place.

Shrub borders are often encouraged along edges, which become important to wildlife and to visual beauty.

Probably the most valuable contribution of ecology to ROW management is that it leads to an understanding of what is happening on the ROWs. While there is no doubt that an alert manager already knows a great deal about this from experience, an understanding of ecological processes will add greatly to long-term management planning.

For example, the use of plant communities can help in predicting development of nontarget vegetation. Communities will also indicate the percent of a ROW occupied by major habitats. This information can be obtained from inventories needed for construction permits and from routine inspections of ROWs prior to maintenance treatments. A knowledge of the typical species composition of major plant communities will indicate the nontarget species that can be expected to occur on major habitats.

Application of the relationship between adjoining forest types and type-sites can be used to predict probable invasion of various capable tree species. While this will be affected by ROW tree removal in maintenance, a relationship will still exist.

Use of soil and topographic information on ROWs will aid in ROW management planning. County soil surveys can be used to predict probable soil drainage and erosion. Vegetation development on a ROW can be predicted from soil types combined with plant communities. In fact, a combination of soil with plant communities is an excellent key to ROW management planning. **WTT**

2,4,5-T SUSPENSION REVEALS NEED FOR EQUALLY EFFECTIVE ROW CONTROLS

By Bruce F. Shank, Editor

The temporary suspension of 2,4,5-T by the Environmental Protection Agency has increased interest in other herbicides for right-of-way vegetation control. In anticipation of suspension and cancellation proceedings against Silvex and 2,4,5-T, and to compare the effectiveness of all registered products for right-of-way vegetation control, Asplundh Environmental Services conducted studies over the past four years.

Their report indicates that loss of 2,4,5-T would affect costs and would require consideration of new combinations of herbicides to accomplish acceptable vegetation control at a reasonable cost. Herbicides which achieve the same broad spectrum control as 2,4,5-T and are comparable in cost present new characteristics to consider such as persistence, unwanted control of desirable vegetation, or ineffectiveness on a few prime weed tree species. However, the report clearly indicates that the loss of 2,4,5-T, although significant, would not cause severe disruptions in current right-of-way spray programs.

Dow Chemical and formulators of 2,4,5-T are taking an aggressive stand against cancellation. Hearings get underway in February and EPA expects them to last a year or more. Therefore, renewed registration of 2,4,5-T is unlikely in the short term. One positive sign that Dow has good ground to stand on is that EPA's own Scientific Advisory Panel suggested that 2,4,5-T presented no significant risk to human health if protective clothing is used by applicators and uses are restricted to specific, low hazard areas, including rights-of-way.

It is clear that mechanical methods cannot replace chemical treatments entirely. Certain areas are not accessable to large clearing devices due to terrain factors. The helicopter equipped with application options has proven valuable for remote, large rights-of-way.

There are nonsuspended uses for 2,4,5-T. They include non-crop sites such as fence rows, vacant lots, certain industrial sites, and hedge rows. The herbicide may be used for these specific tasks until cancellation hearings are complete and a decision is final.

Registered herbicides to control woody vegetation.

Common Name	Trade Name	Manufacturer
amitrole	many	Amchem Prod. Inc.
AMS	Ammate	E. I. duPont
bromacil	Hyvar	E. I. duPont
2,4-D	many	
dicamba	Banvel	Velsicol
dichlorprop	many	Rhodia Inc.
fosamine	Krenite	E. I. duPont
glyphosate	Roundup	Monsanto
hexazinone	Velpar	E. I. duPont
picloram	Tordon	Dow Chemical
tebuthiuron	Spike	Elanco
triclopyr	Garlon	Dow Chemical

Alternative herbicides

According to Asplundh, the main reason 2,4,5-T has been the dominant herbicide in right-of-way weed control is the number of weed species it controls to an acceptable degree. In tests using basal and foliage spray methods, picloram, glyphosate, bromacil, and dicamba individually exceeded or matched 2,4,5-T in effectiveness. However, Asplundh reported unacceptable control of several prime weed tree species with picloram and dicamba when used alone. Glyphosate is comparatively expensive and bromacil at the effective rate is nonselective. As with 2,4,5-T, combinations are the key to the most effective control at the right cost. Therefore, other herbicides are needed to help control tough weed tree species such as ash, hickory and oak.

Before suspension of 2,4,5-T, a combination of picloram, 2,4-D, and 2,4,5-T was the most effective foliage treatment and a combination of picloram and 2,4,5-T was the most effective basal treatment, according to Asplundh.

Persistence is a problem with substitute herbicides. Picloram persists two to three times as long as 2,4,5-T and dicamba twice as long.

Glyphosate and fosamine both have potential despite limitations of cost and time of application.

Asplundh concluded in the event of a 2,4,5-T/Silvex cancellation, a combination of picloram with 2,4-D or dichlorprop or a combination of dicamba and 2,4-D or dichlorprop would be most logical.

Other herbicides fit specific situations most effectively. For example, AMS, glyphosate, and fosamine are safe to use on watersheds. AMS, although corrosive to equipment, is very safe and drift-free near sensitive crops. Sensitivity of crops to picloram is one of its drawbacks in addition to persistence. Nevertheless, picloram may very likely be the primary substitute for 2,4,5-T.

Since the Asplundh study, Dow has obtained registration for Garlon (triclopyr) to help provide control for tough tree species like ash and oaks. It is effective at selective rates and can be applied by high or low volume equipment or by helicopter. Dow intends to offer combinations with Garlon 3A for broad spectrum control.

Asplundh estimated that cancellation (or suspension) of 2,4,5-T will increase ROW maintenance costs by 42 percent over current expenditures, with electric utilities paying the brunt of the increase. This represents a $28.3 million increase overall and comes at a time of already rapidly escalating energy costs for consumers.

Perhaps the toughest prosecution against 2,4,5-T and Silvex is from self proclaimed human victims, not mice or laboratory animals. A school teacher who miscarried suspected dioxin contamination of stream water by nearby spraying in timberland. Over a three-year period she collected information on miscarriages in the area, and with a physician's help, submitted her report to the media, legislators, and the Environmental Protection Agency.

The issue then became an emotional one and one of the first to be supported by information on human suffering. EPA's Scientific Advisory Panel certainly had this data when they considered 2,4,5-T and Silvex and recommended that a ban was not required. Now, it is the manufacturers, users, and the Scientific Advisory Panel against the full power of the ecology band wagon. Hearings will begin in February to provide a judge with enough information to make a decision. And even if he rules not to cancel registration, EPA Administrator Douglas Costle can overrule. **WTT**

Relative comparison of effectiveness between 2,4,5-T and potential alternative chemical on woody vegetation based on data from Bovey (1977).[1]

	BASAL SPRAY			FOLIAGE SPRAY		
CHEMICAL	Number of Species Susceptible	Total No. of Species	% Control	Number of Species Susceptible	Total No. of Species	% Control
2-4-5-T	120	189	63	89	280	32
AMS	56	165	34	45	194	23
bromacil	135	169	80	53	73	73
2,4-D	44	152	29	58	258	22
dicamba	36	57	63	41	130	32
dichlorprop	16	64	25	20	117	17
glyphosate	—	—	—	73	75	97
picloram	55	66	83	84	155	54

[1]USDA Handbook No. 493, by Rodney Bovey (1977)

Relative comparisons of 2,4,5-T versus alternative herbicides.

Chemical	General Efficacy	Methods of Application	Cost Per Treatment	Advantages	Disadvantages
2,4-D	+[1]	=	=		
dichlorprop	+	=	=		
AMS	+	+	=	Safe on watersheds and near sensitive crops.	High rates required. Corrosive to application equipment.
bromacil	—	+	=		Leaches readily, injurious to desirable woody plants. Soil sterilant at rates needed for brush control.
glyphosate[2]	—	+	=/+	Safe on watersheds. No brownout with foliar application.	Only used in foliar season; nonselective.
fosamine[2]	—	+	=/+	Safe on watersheds. No brownout with foliar application.	Only used in foliar season.
dicamba	=	—	+		Best when used in combination with 2,4,5-T. More persistent.
picloram	—	—	=		Sensitivity of certain agricultural crops. More persistent.

[1] + 2,4,5-T is superior to alternative
= 2,4,5-T is comparable to alternative
— 2,4,5-T is inferior to alternative

[2] New herbicides, evaluation based on limited data.