4 reasons why it pays to spray for Dutch elm disease control this fall

1. Effective. Most authoritative researchers have stated that DDT sprays applied in the fall are just as effective in preventing elm bark beetle feeding, during the period of tree susceptibility to Dutch elm disease, as sprays applied in late winter or early spring. Our co-operative research tests with a Midwest University bear out this conclusion.

2. Better weather. There usually are more good spraying days in the fall than in spring. It is much, much easier to get thorough coverage on a pleasant, relatively calm fall day, than on a gusty day in spring.

3. Efficient use of labor. You get better distribution of work loads by beginning your Dutch elm sprays in the fall – finishing in spring, if necessary.

4. Fewer bird problems. There are fewer problems with birds and other wildlife (real or imagined) when you spray in late fall.

To assist you in saving our beautiful elms, we offer:

AMOCO® Elm Spray—25% DDT plus White Oil, the "old standby" in Dutch elm disease control programs, proved effective in wide commercial use since its introduction in the early 1950's.

AMOCO® Elm Spray-32.4—32.4% DDT in a carefully selected xylene solvent, also used with very satisfactory results since its introduction in 1960.

AMOCO® Methoxychlor Spray—Used in many control programs, mainly in the spring, for maximum safety to birds.

Technical assistance. For help on your specific pest control problem, contact your local American Oil Office, your spray materials dealer, or write direct to: American Oil Company, 910 South Michigan Avenue, Chicago, Illinois 60605.

YOU EXPECT MORE FROM AMERICAN AND YOU GET IT!*

American Oil Company *Trademark

"Now that we're using Copper Sulfate, our water problems are very few"

reports Mr. John Courchene,
Director of Water Quality for the Seattle Water Department

Constant sampling is one of the safeguards insisted upon by Mr. John Courchene, Director of Water Quality for the Seattle Water Department.

Seattle uses copper sulfate to treat not only the 725 acres but also the 7 mile shoreline of its primary storage and sedimentation reservoir. "Our primary objection to using other algae control chemicals is the difficulty of application," Mr. Courchene says. "When you total the cost of chemical purchase and application, copper sulfate is less expensive."

Seattle has been using copper sulfate for water treatment since 1940. At that time, they used approximately 20,000 pounds per year; in 1963, they used 70,000 pounds; in 1964—92,000 pounds. Mr Courchene says, "We usually treat the entire lake in fall, winter and spring. During the other months we generally make shoreline applications. At one time we had a problem with Isoetes, an aquatic rooted plant which rises to the surface and drifts over the lake. Before using copper sulfate we had to rake the shoreline, which proved expensive. Now that we apply copper sulfate from winter through spring, this problem is virtually eliminated."

While water can be treated by simply dragging a burlap sack of copper sulfate crystals behind a rowboat, labor costs frequently suggest more efficient procedures. The Seattle Water Department has designed and built two specialized pieces of distributing equipment. For the treatment of the lake itself, a large, bronze, mesh-screened hopper was constructed. Copper sulfate is fed into the submerged screen hopper which is mounted on the stern of a power launch. The boat is steered over parallel courses approximately 100 feet apart. Prop wash spreads the copper solution out over an area approximately 100 feet wide. For shoreline application, a portable blower is mounted on a truck and a belt of copper sulfate 30 to 50 feet wide is blown out over the shoreline from the truck as it is slowly driven along the top of a dike that encircles the lake.

Seattle designed and built simple, efficient equipment for distributing copper sulfate by power launch.

The Seattle reservoir, when full, holds about 11 billion gallons of water, of which about 4.6 billion gallons are available to intake. "We use the available water figure when determining how much water we wish to treat. The amount of copper sulfate is determined by the quantity of water, water temperature and number and types of algae present. Both shallow and deep samples are collected each week from six sampling stations, as well as from the reservoir's source of supply and its distribution system. There is no industrial contamination and, now that we're using copper sulfate our water problems are very few."

For assistance on your water problems, Phelps Dodge Refining Corporation—one of the world's major producers of copper sulfate—can supply the following: Information on systems and equipment developed and used by water works and commercial applicators; literature, containing data and chemical formulas; technical assistance in algae and water weed control. Write: Phelps Dodge Refining Corporation Information Service, 300 Park Avenue, New York, N. Y. 10022.

PHELPS DODGE REFINING CORPORATION

300 PARK AVENUE, NEW YORK, N.Y. 10022

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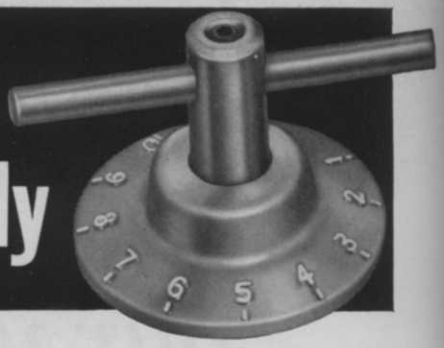

New exclusive "Dial-A-Stump" lets you dial the cutting speed you need! Easiest method yet for controlling speed of the cut on the cross swing to match toughness of the stump. Remove stumps in a fraction of the time with this great breakthrough in operating efficiency.

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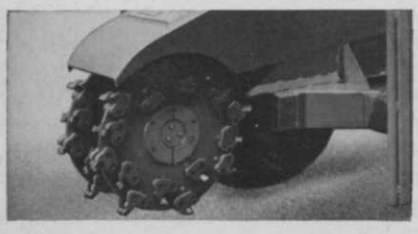
you also get these many other exclusive benefits



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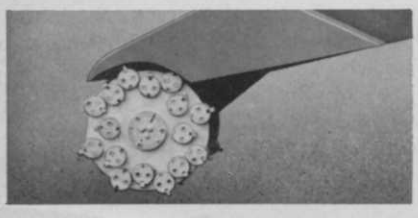

EXCLUSIVE MANEUVERABILITY Extendable cutter head has 30" forward travel, plus side-to-side movement — reaches out to get at stumps even in congested hard-to-reach places.

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WEEDS TREES and TURF

FORMERLY WEEDS AND TURF

October 1966
Volume 5, No. 10

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Just Looking for a Home

In this issue, WEEDS TREES AND TURF begins a new feature with our first Monthly Insect Report. Because we feel there is a need for more grass roots information on the whereabouts of our migrant problem pests, we'll report each month on insects, attacking turfgrasses, trees, and ornamentals throughout the country.

In this mobile society of ours, there are many insects still looking for a home. Consider, for example, the immigrant European chafer *(Amphimallon majalis)*, a light-brown beetle, about ½ in. long. Chafer larvae feed on turfgrasses, causing the turf to brown and die out. With its airborne, nocturnal mating habit and a bent for traveling by auto, rail, or aircraft, the chafer is spreading.

From New York it has migrated to Connecticut, New Jersey, Pennsylvania, and Ohio. Parts of New York and Connecticut have been placed under quarantine, requiring chafer-free certification for sod, topsoil, gravel, sand, and some plants before they are moved from the area. But the beetle is still looking for a home. This year, it was reported for the first time in two Pennsylvania counties and four New York counties, and the first Massachusetts infestation was observed in the Boston area. Who knows how long it will be before turf managers, golf course superintendents, and CAs in other states encounter the chafer?

Pinpointing the insect won't solve the problem, of course, but it's the first step. Annually, state and federal agricultural agencies survey the chafer's peregrinations, and this summer, Connecticut set out traps to tip off the growing infestation. Unfortunately, that state's previously effective spraying of infested areas has been terminated because of "pesticide nerves." The beetle is almost sure to spread further.

USDA counsels control of the chafer by the use of soil insecticides. And, it urges a sharp eye for the pest, requesting those who collect suspicious specimens to join the chafer war by sending them to USDA's Plant Pest Control Division. Our point is this: the rapid spread of insect infestations doesn't permit the turfman or treeman to work in a vacuum. Coordinated effort is required in the war on destructive pests, and the first stage is to know and share the knowledge of the insect's home. WTT hopes to contribute to this knowledge with its Monthly Insect Reports (page 30).

WEEDS TREES AND TURF is the national monthly magazine of urban/industrial vegetation maintenance, including turf management, weed and brush control, and tree care. Readers include "contract applicators," arborists, nurserymen, sod growers, and supervisory personnel with highway departments, railways, utilities, golf courses, and similar areas where vegetation must be enhanced or controlled. While the editors welcome contributions by qualified freelance writers, unsolicited manuscripts, unaccompanied by stamped, self-addressed envelopes, cannot be returned.

WTT Mailbox

What To Do About Ground Pearl

Will you please let me know how to control ground pearl? A great many of the lawns in our city are infested with this insect, and a lot of grass has been killed. But, we have been unable to find any information on these pests or a suitable chemical for their control.

George Madray

Economic Exterminating Co.
Jesup, Ga.

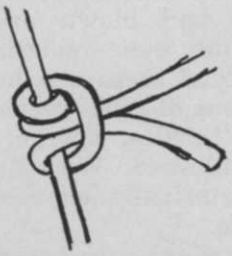
We did a bit of research into the scale insect, ground pearl, Margarodes meridionalis, and found that it has been fairly recently recognized as a cause of serious damage in southern turfs, particularly in centipedegrass and bermudagrass. The "pearl" is a hard shell, about ⅛ in. in diameter, that is secreted by the nymphs, which destroy grasses by feeding on their fine roots. Most control recommendations specify either that the lawn be nursed through the attack, or that grass be replaced with more resistant varieties, or that the soil be sterilized before replanting with seed or noninfested sod. We asked for an expert's opinion on how to control ground pearl and received the following recommendation from Professor Kirby L. Hays of Auburn University, Auburn, Ala.:

Ground pearl, *Margarodes meridionalis,* is quite a problem in turf management. For several years we have done some research on this problem and recommend the following procedure for control: Apply 1.9 pints of 75% of emulsifiable VC-13 (Nemacide) in 10 to 15 gal. of water per 1,000 sq. ft. of sod, and wet the sod thoroughly after treatment. Do not apply the insecticide when people or animals are present and do not allow the insecticides to drift to other areas where they might injure people or animals. After the insecticide has been applied, do not permit children or pets in the area until the insecticide has been washed into the grass and the grass has dried completely. Persons using this or any other insecticide should read the label and follow the instructions thereon.

Doesn't Like Knot

Sorry, but we feel we must jump on Mr. Bryan again in regard to his article in your August issue, "Safety and the Tree Surgeon." His photo clearly illustrates an improperly made climbers' knot.

The sketch below indicates a properly made knot. This knot must be kept tight in order to



effectively bind when released. The knot will slide only when held in a vertical position.

Congratulations for an excellent article on sycamore anthracnose by Dan Neely. We need more of this kind of specific information.

James W. Taylor

James W. Taylor Tree Surgery
Newburgh, N. Y.

Queries Time Evaluations

I recently came across the following time evaluations for industrial landscape maintenance operations. I believe the figures were compiled in 1964, and I am wondering just how far they hold true now. Can you tell me if these are good, realistic figures, or can you recommend any other guides?

Here they are with times given as standard minutes for 1,000 sq. ft., potential minutes for 1,000 sq. ft., and number of times performed each week:

Lawn Operations:	Std.	Pot.	Times
Mowing	5	3	1
Hand watering	5	3	2
Sprinkler watering	2	½	2
Pest Control	10	1	1/4
Weed Control	10	5	1/8
Shrubs and Ground Covers:			
Weed and prune	60	30	1/4
Pest Control	10	5	1/4

What I assume to be standard times are also given for these operations: fertilizing with 18" hand spreader, 10,000 sq. ft. per hour; light raking, by hand, 2,000 sq. ft. per hour; dethatch raking, by hand, 600 sq. ft. per hour; mowing and edge trim, with 18" hand mower, 7,000 sq. ft. per hour; mowing and edge trim, with 18" power mower, 15,000 sq. ft. per hour; mowing and edge trim, with 25" riding mower and power edger, 40,000 sq. ft. per hour.

(Name withheld on request)

We've checked our files and have been unable to locate time study data on these landscape maintenance operations. WTT therefore invites its readers to send in their comments on the figures. Are they up-to-date and realistic? We'd like to hear from experienced landscape maintenance men what they think.—Ed.

Sends Beautification News

William H. Bartles, of W. H. Bartles Tree Service, Hyde Park, New York, sends news of his election to the office of Supervisor of Hyde Park and word of one of his first official acts, formation of a Shade Tree Commission, which is designed to add arboreal attraction to the historic town:

It is our intention to set up a tree planting program with the town highway forces doing the actual planting in the early spring just after the frost is out. We intend to use town-owned property as a small nursery to furnish streetside planting stock. Young sugar maples will be set out and will be transplanted along the streets when they reach 1½ in. diameter. Other species, such as Kwanzan and European linden will be used as well as maple. Trees will be planted bare root in the dormant season, which will work well with the highway department because crews are not too busy. The Shade Tree Commission will also give advice to homeowners on care and maintenance of their properties. We think this should be a big step towards beautification of the town.

How Minnesota Uses

Invert Roadside Sprayer

By

BERT J. PINSONNEAULT

County Highway Engineer
Wabasha County, Minnesota

WEED CONTROL, required for many years in Minnesota, has been a part of the job during my 30 years as a highway engineer because weed-free roadsides are essential for traffic safety, road maintenance, winter travel, and beautification. Also, good weed control helps the farmer by cutting down the number of seeds available to infest his farmland and helps the hay fever sufferer by getting rid of weed pollen.

In the early days, we had no alternative but to mow weeds, chop brush by hand or with mechanical equipment, and burn when local conditions permitted. As everybody in the business knows, this was time-consuming, tedious, and never-ending. Roots remained and weeds and brush sprouted right back.

The first chemicals introduced for weed control removed all vegetation so that soil was easily eroded and blown away. We could use these materials only for special areas and heavy infestations of such weeds as ragweed, thistles, spurge, cattail, and milkweed. We still had to rely principally on mechanical controls.

Tremendous contributions to weed control were made by 2, 4-D, and subsequently 2,4,5-T, because they killed broad-leaved weeds and brush, yet left desirable grasses. But getting these materials to behave was sometimes a problem, since when applied as the conventional oil-in-water spray, some drift of fine particles occurs even in calm weather.

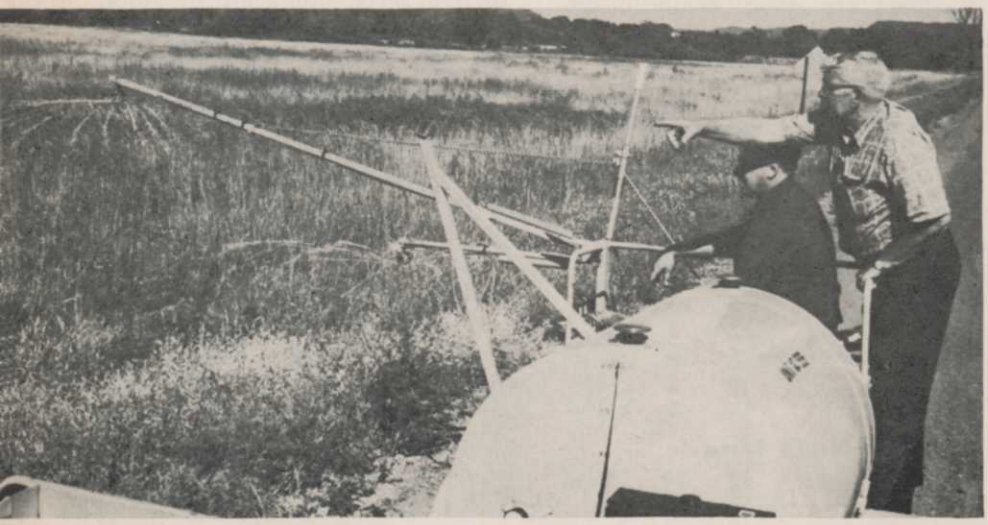
Wabasha County, located in southeastern Minnesota, is a scenic county with wooded hillsides, excellent cropland, and beautiful farms. It has ample rainfall, and conditions for plant growth are ideal. Such susceptible crops as soybeans, vegetables, fruit, and clover are grown adjacent to the roadsides. Of course, our citizens do not want their crops, ornamentals, and other desirable plants along the highways damaged.

For many years we sprayed our roadsides with 2,4-D and 2,4,5-T herbicides, successfully, using conventional-type sprayers, but we had to contend with a certain uncontrollable amount of damage from drift over adjoining areas. This resulted in a public demand for strict control over the use of herbicides. We had to come up with a safer method of application if we were to continue spraying our roadsides.

New Spray System

Early in the spring of 1964, we first learned of invert spray equipment that would produce and apply herbicides as heavy wind-resistant droplets having the appearance and consistency of mayonnaise. This water-in-oil spray, called an invert because it contrasts with the conventional oil-in-water spray, appeared to be the answer to our drift problem.

Lyon Chemicals, Inc., of St. Paul, Minn., introduced this new spray system for ground application of 2,4-D and 2,4,5-T products. The sprayer, engineered and manufactured by the Minnesota Wanner Co. of Minneapolis, is a complete bifluid unit mounted on a two-wheel trailer that can be pulled by truck or tractor. Arrangements were made for this equipment to be



Bert Pinsonneault inspects good coverage of right-of-way obtained from 9-ft. and 3-ft. booms. Both booms are attached to the trailer and can be turned on and off as needed.

demonstrated to the Board of County Commissioners and some of our maintenance personnel.

The demonstration unit was equipped with a handgun only, but it gave us a definite indication as to size of droplets it produced and assured us that the drift problem would be negligible. We determined that a 12-ft. boom with three or four adjustable nozzles would provide controlled roadside coverage. Using this boom and the handgun, our crews could reach all areas along our highways.

In the spring of that same year, we purchased the first boom-equipped Wanner Invert Roadside Sprayer commercially used in the United States. It has proved so successful that we now have two units in Wabasha County. The Minnesota State Highway Department and 18 other county highway departments are using these spray units. Rural electric cooperatives and private power utilities also have these invert ground spray units in operation.

As a matter of fact, I've worked with just about every method of weed control during my 30 years as a highway engineer in Minnesota, and the invert sprayer does the job better than anything we've tried before. The equipment gives a good spray pattern for killing weeds, and most important, controls the spray to prevent drift.

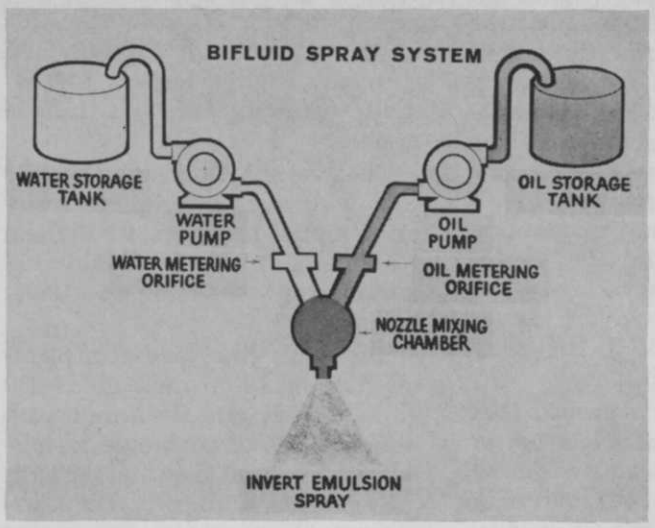
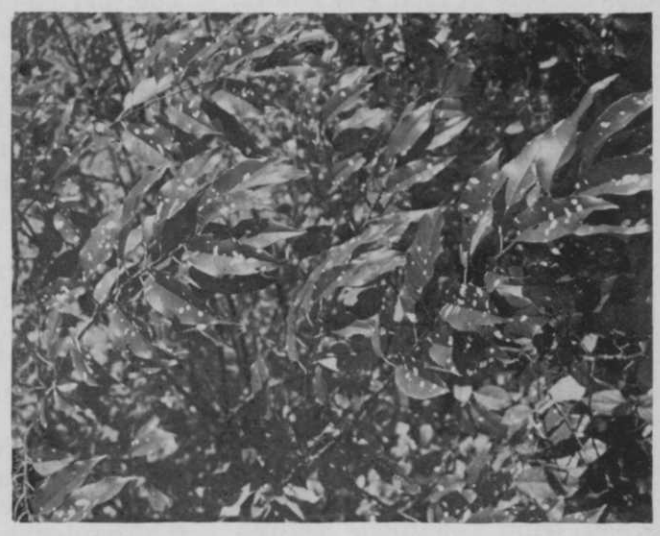


Fig. 1. (left) shows schematic drawing of the bifluid invert spray system. In practice, newer units use one tank with a divided compartment for the chemical.



Closeup (right) of typical pattern left by the invert sprayer, showing good coverage that results in effective control of roadside weeds and brush.

Use In The Field

From the beginning, the Wanner Roadside Sprayer gave good drift control, and this was our primary objective.

But, as with most new equipment for a special use, the first year under field conditions turned up some problems. The 12-ft. boom was too long and not flexible enough for the areas that required a shorter swath. Nozzles were too close together, causing overlap in the pattern and chemical waste. And, droplets were too large.

The manufacturer supplied newly designed tips, and we increased pressures slightly. The droplet size was reduced and can now be controlled to each job requirement. It was found that only two nozzles were required to do the job with the 12-ft. boom.

Our second unit, now in operation, has a "stub boom" only 3 ft. long, as well as a 9-ft. boom and a handgun. With the short and long boom and handgun, we have maximum flexibility to move around poles and mailboxes to reach all areas along the roadside with one trip. Also, we can keep the spray within the narrow sections of right-of-way.

We found the operation of the invert sprayer somewhat different from that of conventional equipment because the bifluid sprayer is really two systems in one. But our operators soon developed the skills needed to handle preparation and pressure adjustments.

The invert takes less water volume than the conventional 2, 4-D and 2,4,5-T sprays. We can start out with enough water to spray about 60 acres a day and do not usually have to waste spray time by returning to the shop to refill the tank.

The white color of the mayonnaiselike droplets helps the operator positively identify where he has sprayed. If wind velocity is questionable, crews can check to be sure the herbicide is falling only where weeds and brush are. If there is a question about good coverage, individual weeds and brush can be checked for the desired pattern.

With good drift control, our crews spray many days when we couldn't think of spraying with conventional 2,4-D formulations. This enables us to do more roadside spraying during the period that weeds are actively growing and are more easily killed. We can also spray closer to fence rows and farm lands with a much greater degree of safety.

The invert droplets resist

washoff. We know because showers have come up unexpectedly right after spraying without adverse effect. Resistance to washoff has enabled us to spray dew-covered weeds and brush in early morning with good kill. Fog is not uncommon during the day in the southeastern Minnesota valleys. Our crews using the invert never have to wait for it to lift; they go right on spraying.

Our crews have observed that the sticky invert droplets better control some species of weeds or brush that characteristically have a waxy or thick outer cuticle. Because of their oily nature, the invert droplets seem to stick and penetrate these leaf surfaces more effectively.

There is no better proof of drift control than the fact that we have had no damage claims from our invert spraying during the three-year period that it has been in use. And, each year we have used this equipment to cover an average of 230 miles of roadside adjacent to farmland.

Cost Comparison

We have continued to keep and use our conventional spray equipment on a limited basis when wind conditions permit. However, the invert equipment has proved so satisfactory that we are using the conventional less and less each season. Comparing costs between the two methods, we have found that the cost per acre is about the same. Even though the invert chemical costs slightly more, the reduced labor time per acre with the invert offsets the additional chemical costs.

About the Equipment

We learned from Cliff Schrader of Lyon Chemicals, Inc., that the idea of spraying invert formulations had been under development for some time. The major problem had been to engineer a spray system that could pump the thick invert emulsion to nozzles and release it with a uniform pattern.

The Wanner Roadside Sprayer does this with a bifluid system that pumps the water and herbicide from separate tanks to the nozzle, where a thick emulsion is simultaneously formed and sprayed. Figure I gives a schematic drawing of this bifluid system.

The Wanner Roadside Sprayer that we use is a complete spray unit mounted on a two-wheel trailer. It is also available skid mounted for installing on a truck bed.

The tank has two-compartments: the large tank holds 260 gal. of water and the small tank holds 40 gal. of herbicide formulation. The unit is equipped with a 10-gal.-per-minute positive displacement pump on the water side, and a 3-gal. piston pump on the chemical side. For optimum operation of the booms, pressures are maintained at 30-35 p.s.i. The handgun performs best with pressures of 100-125 p.s.i.

Invert roadside spray units are now available with a handgun and one or two booms that break-away for poles and other roadside obstructions and that are adjustable in height. The standard single boom is 13 ft. long with two nozzles and gives a 16 ft. to 20 ft. swath. This boom can be extended to 17 ft. which adds the third nozzle and increases the swath to 24 ft. to 30 ft. The double-boom units have a 9-ft. boom and a 3-ft. stub boom. The single nozzle on the longer boom is faced outboard and reaches 16 ft. to 20 ft. The stub boom nozzle faces inboard and covers an 8-ft. to 12-ft. swath.

The Hercules Low Volume nozzles are supplied to Minnesota Wanner from Hercules Incorporated, manufacturers of the herbicide formulations. The nozzle and special tips used in the bifluid spray system have been engineered and field tested to give the optimum spray pattern for weed and brush control with regulated drift.

Application Rate

The roadsides of Wabasha County are infested with a wide variety of brush including plenty of sumac and boxelder as well as a number of annual and perennial broad-leaved weeds. We have found that ¾ lb. of 2,4-D and ¾ lb. of 2,4,5-T acid equivalent per acre gives good weed and brush control.

The "Visko-Rhap" formulations used in the Wanner Roadside Sprayer, as well as the equipment, are distributed by Lyon Chemicals, Inc., of St. Paul. "Visko-Rhap" formulations containing 2,4-D and 2,4,5-T are recommended for normal spraying of a variety of weeds and brush. "Visko-Rhap" formulations containing 2,4,5-T are used for fall spraying and for hard-to-kill woody plants.

The recommended uniform travel speed for the Wanner Roadside Sprayer is 3 to 7 m.p.h., depending on the height, density, and type of weeds and brush. For dense brush or heavy infestation of noxious weeds, additional chemical may be applied with the handgun.

Heated Turf Grows Faster, Is Frost-Free, More Popular

With the installation of underground heating cables in the football field turf of the U. S. Air Force Academy's Falcon Stadium, The Singer Co., whose Climate Control Division made the cables, predicts increasing popularity of turf heating.

Cables were installed 1′ apart at 8″ below the surface, and are said to be designed for frost- and snow-free football, with fewer injuries from frozen field surfaces. A similar installation is planned for the new Civic Center Busch Memorial Stadium in St. Louis, and interest has reportedly been expressed in other areas. If used for baseball field turf, Singer says, heating cables would encourage faster growth, cut down on seeding and sodding, and allow the use of sturdy, southern grasses.

Experiments in turf heating have been conducted since 1962 at the varsity practice football field at Purdue University in Lafayette, Ind. Singer adds that heated playing fields have been in existence in Europe since 1959.

Write the Singer Co., Climate Control Div., Box 7047, Cleveland, Ohio 44128, for additional data on heating cables.