

WEEDS and TURF

MAY
1964

The grass-roots magazine of vegetation maintenance®



Spraying for brush control along roadsides is a big market for contract applicators.

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New Tree Care Techniques
Shown at Amherst . . . 26

**“Brush Control” Subject of
Special W&T Report . . . 12**

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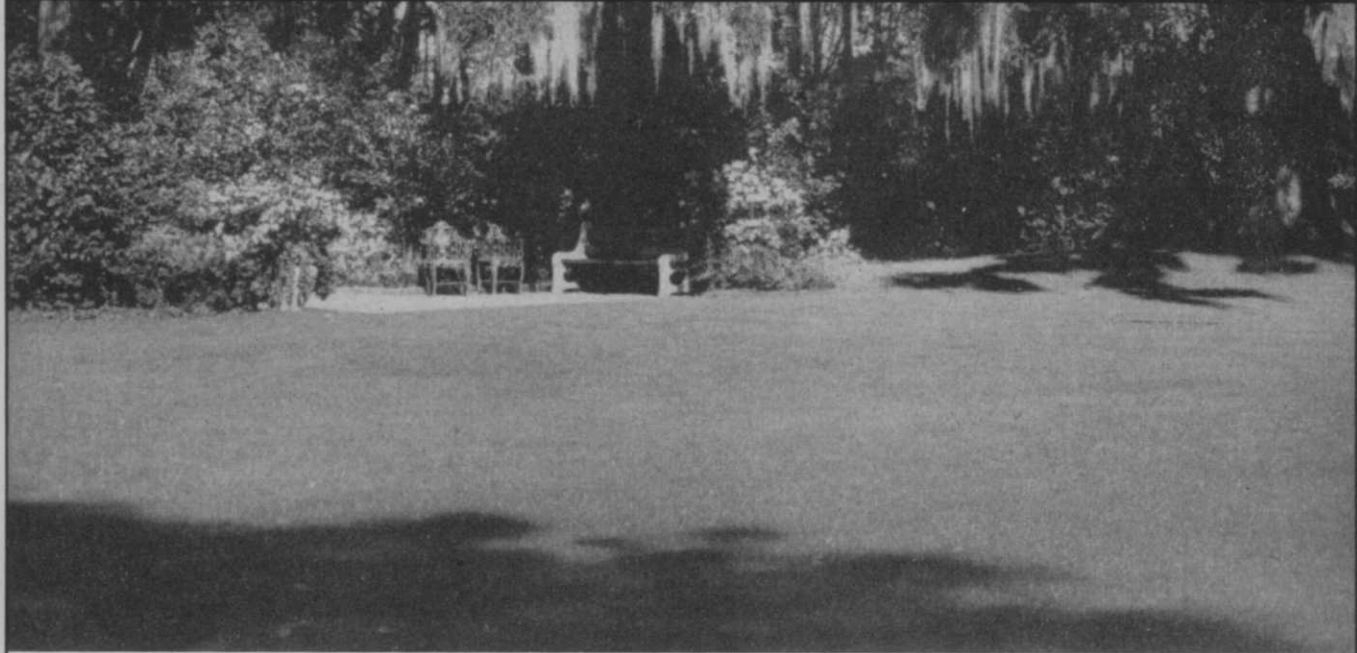
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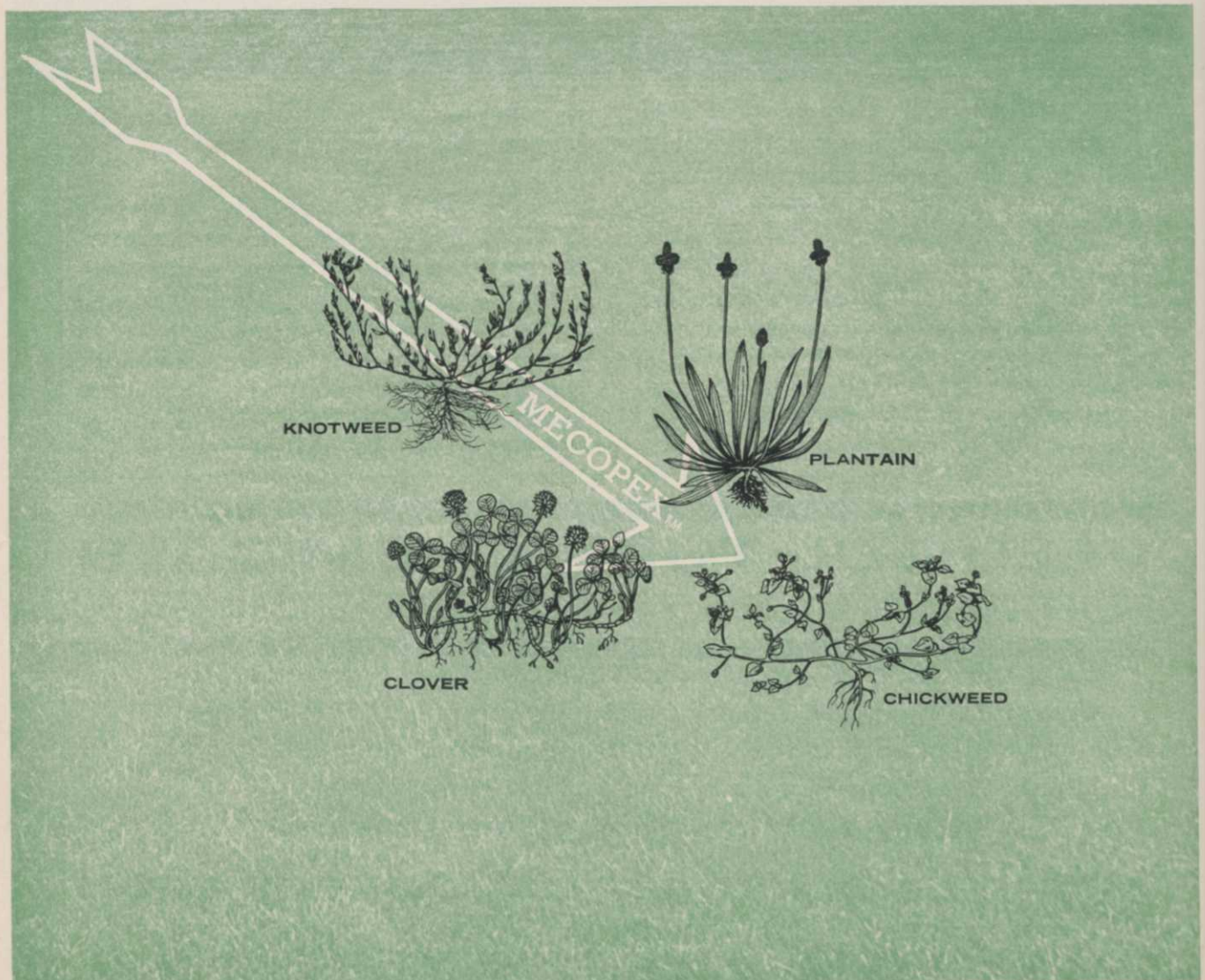


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WEEDS and TURF

May 1964

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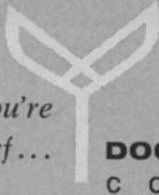
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C O M P A N Y

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C O M P A N Y

Springfield, New Jersey

All or nothing!

Almost since its inception, this magazine has encouraged the establishment of a national trade association of contract applicators who engage in vegetation maintenance (*W&T*, Jan. '63, p. 5; Feb. '63, p. 5).

It looks like this desirable goal will soon be realized. The Horticultural Spraymen's Association of Florida, for example, has appointed a special committee to draw up a national charter.

Applicators in the Texas-Oklahoma region are banding together with the same idea, and recently began to negotiate with HSAF. In the Pacific Northwest, several applicator groups have set up a regional conference.

But looming prominently in the discussions of such a move, we have learned, is the question of what forms of "vegetation maintenance" the new association should embrace.

Should weed and brush control, turf management, and care of trees and ornamentals *all* be included? Or should the group limit itself to a single type of service?

Naturally, there are those who envision the association-to-be as the voice of a single specialized field, such as industrial weed control, or lawn spraying. And there are those whose geographical areas make one form of the business more important than another.

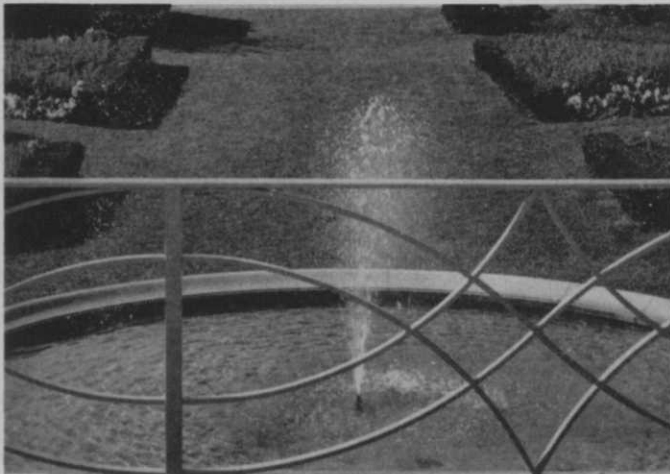
But we are convinced that this industry is essentially a unified and all-encompassing one, and that the contract applicator's destiny lies ultimately in offering a complete range of services. We believe that those who are engaged in the enhancement or control of vegetation in any of its forms have so much in common that it is ill-advised to single out any one phase of the profession to the exclusion of another.

Founders of this new association must seek to understand the interrelationship of turf management, weed and brush control, and care of trees and ornamentals. To gain the *nationwide* support necessary in so important an endeavor, the association must serve all interests in the industry.

We stand squarely behind this movement to create a national body of applicators. But if this body is to grow in strength and stature, if it is to have the backing of firms from coast to coast, it must look beyond specialty interests and gain a comprehensive notion of the entire industry which now cries out for a national image.

To do less will cripple the association's leaders before they have even started their difficult jobs. In this case, it's all or nothing.

WEEDS 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, 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.



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HSAF Eyes National

I'd like to take this opportunity to thank *Weeds and Turf* magazine for the help you've given the Horticultural Spraymen's Association of Florida in the last year.

As you know, we have considered becoming a national trade association for the past two or three years, and this year we are making a beginning in this direction.

For this task, I've appointed one of our most dedicated members, Mr. Larry Nipp, American Power Spray Co., 3675 S.W. First St., Ft. Lauderdale, Fla., who is a past HSAF president. Larry has been authorized to call an organizational meeting for the purpose of drafting a charter for the national group.

I hope you will inform your readers throughout the United States about our intentions.

Ted Kaplan

President
Horticultural Spraymen's
Association of Florida
King Spray Service
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Miami 56, Fla.

Quick-breaking Emulsions Not Necessarily Cheap?

Congratulations on the growth of *Weeds and Turf* to a complete and separate publication. You have achieved this, in part at least, by recognizing articles which appeal to the "weed, turf, and tree" industry both in subject matter and in presentation.

The article "How Good Are the Formulations You Buy" by Frank L. Wilson (Jan. 64, p. 8) deserves much commendation. What Mr. Wilson says is very apt for much insect work, especially the chinch bug and sod webworm problems in lawns. I heartily endorse his statement, "The major contributing factor to poor quality formulations is price buying."

But I do question his attitude that quick-breaking emulsions are cheap, low-quality formulations. Some manufacturers and formulators make quality quick-breaking emulsifiable concen-

trates. In fruit spraying, for instance, a deposition of the pesticide at or close to the point of droplet impact retards loss due to runoff and gives longer residual action during rainy weather. When 2,4-D or 2,4,5-T quickly separates from the water carrier it can better penetrate the waxy leaf coating to enter the weed plant and be translocated within.

Philip H. Marvin

Insect and Weed Control Consultant
Manhattan, Kansas

We forwarded Mr. Marvin's letter to author Wilson who writes as follows:

You are quite correct in questioning that all quick-breaking emulsions are cheap, low-quality formulations. Certain formulations are designed to be quick-breaking. The choice of quick or slow breaking is dependent entirely on what one wishes to accomplish.

The article you refer to was written specifically for lawn spraymen. Many here in Florida were using poor-quality, quick-breaking formulations of parathion to treat home lawns for chinch bugs. Not only did this result in poor control, but it also caused heavy parathion residues upon the grass leaves, which we felt was a hazard to the public.

Frank L. Wilson

Entomologist
Florida State Board of Health
Jacksonville

Who Makes Lawn Dyes?

Please tell me who sells a dye for use on lawns.

F. B. Parrott

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One supplier is the Doggett Fison Co. of Springfield, N.J. Others are invited to write directly to Mr. Parrott. Ed.

Weeds and Turf welcomes expressions of opinions from its readers. Send ideas and comments briefly as possible to Charles D. Webb, Editor, Weeds and Turf, 1900 Euclid Ave., Cleveland 15, Ohio.

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WHAT actually constitutes "brush?" One easy description is the term "woody weeds." Plants commonly thought of as weeds are herbaceous (non-woody). Brush, however, differs in that individual plant cell walls have extra chemical support which imparts to woody plants their rigidity. Woody plants are all perennials which, under favorable conditions, increase in size from year to year until maturity. Readers will note that under this definition of brush

young and mature tree species are also included.

Brush control is essential to transportation facilities and utilities because brush interferes with maintenance, repair, and patrolling operations. Highway visibility is necessary and brush which impairs drivers' vision is a definite hazard. Uncontrolled brush can cause outages on power lines and can damage communications systems.

Industrial storage areas become more efficient when ma-

terial is free of brush. Rodent habitation in fields adjacent to food processing plants is eliminated when removal of weedy brush also removes rodent hiding places. Oil storage tank "farms" and pipeline operations require a "no weeds" policy for maximum protection from fire.

Brush removal improves rangelands and cultivated timber stands also. Destruction of brush along irrigation canals stops water robbery through evaporation. "Dried up" springs



Brush Up

ON BRUSH CONTROL

This basic manual on brush control is meant as a refresher for old pro's and as an introduction for neophytes.

Results of another Weeds and Turf field research project

Truck-mounted spray rig (left) is ideally suited for spraying roadside brush. Huskier vehicles (shown in distance at upper right) can penetrate some utility rights-of-ways. Crew on foot (lower right) can maneuver to pinpoint spray operations in rights-of-ways.

and wells have been known to flow soon after water-robbing brush was killed.

Brush control is used in fire breaks to prevent the spread of wildfires in drought-ridden areas which readily burn over. Fire fed by light fuels such as dry grass is more easily controlled than fire fed by dense brush.

In all of these endeavors, brush control by chemical means does the job more efficiently than hand or machine cutting,

and with a greater degree of permanence.

All this means that by use of the various methods of chemical control described in this article, there is a good year-round market for contract brush control, and contract applicators may profitably participate if they keep abreast of the subject.

Classifying Brush

Some important points to consider are: the types of brush; identification of particular species, resistant and susceptible;

why methods other than chemical are less effective; chemicals used for control and how they should be handled; equipment used in the control of problem brush.

Types of brush are arranged in three categories for better description. Stands of *small* brush have trunk sizes less than 1 inch in diameter; *medium* stands range from 1 to 2 inches; and *large* brush exceeds 3 inches trunk diameter.

Short brush varies from 2 to 4



Pistol-grip sprayer (far left) permits operator to direct his spray pattern with accuracy. Sometimes it is necessary to spray trunks around bottom (near left). Photo at right by O. A. Leonard of the University of California (Davis) demonstrates how firebreaks may be left standing after brush has been cut and seedlings sprayed.

feet high; *medium* height from 4 to 8 feet; and *tall* grows 8 feet and higher. Over 15 feet, one thinks of the species in question as a tree.

To estimate density of a brush stand, it is necessary to determine approximately how much ground is covered by the brush. If it is *light*, it covers 25% of the ground or less. *Medium* stands cover 25 to 75% of the area, and *heavy* stands, 75% and over.

These groupings are used because brush identification is a less familiar subject with some workers and infestations usually occur in what is called "mixed brush stands." Such arbitrary classification should not, however, eliminate the need for proper and accurate identification of species in a stand of mixed brush.

Know Species, Save Money

Time taken for an identification survey of a brush stand can save money by indicating the proper chemical to use, thereby saving time and expense involved in treating a reinfestation or re-treating an ineffective application because of resistant species.

In truth, a contractor cannot economically bid on a brush control job without knowing the composition of brush. The *least expensive* treatment may *not*, in cases where resistant species are involved, be the most *economical*.

Unfortunately space limitations prohibit a discussion of brush identification. A listing of sources at the end of this article gives names of books which deal with brush and tree identification. Lists of resistant brush species can be found in most university or governmental publications covering brush control. Two very good sources are "Chemical Control of Brush and Trees," U. S. Dept. of Agriculture Farmers Bulletin No. 2158, and for those interested in western brush, "Chemical Control of Woody Plants in California," California Agricultural Experiment Station (Davis, Calif.) Bulletin 755.

Chemical manufacturers are also happy to supply technical

data concerning effectiveness of their chemicals against particular brush species.

Methods Other Than Chemical

A short discussion of non-chemical controls is in order so that it can be pointed out where these methods fall short of the results which are considered desirable.

Cutting has been the most popular control method for a very long time. For large modern-day operations, cutting requires many men or a lot of time; it may be a hazardous occupation. With present-day labor wages, such cutting operations may cost as high as \$800 per acre.

Cutting has one inherent disadvantage which often creates more problems than it solves. When brush or trees are cut, sprouts often arise from the roots and stumps and create a dense impenetrable growth. This phenomenon is caused by removal of the dormant bud suppressing effect or what botanists call "apical dominance."

The apex is the tip of a main stem or a twig where new growth normally begins. Those who study plants and their growth processes tell us that the apex or main stem tip produces a chemical hormone which suppresses any lateral growth from buds below the tip. If the apex is cut off, it no longer supplies the suppressing hormone and new twigs sprout. The object of control is to reduce the number of stems per area; this method actually increases the stems per area.

Large machines have been developed for use on ranges and pastureland for the uprooting or crushing of brush. These machines are too unwieldy for use anywhere else. Cables drawn between two tractors can uproot certain small brush species, but this process is expensive in terms of equipment, manpower, and the destruction of desirable range species which are run over in the cabling process.

Brush in some situations can be burned under control so that damage to adjacent areas is minimal. Patterns of ignition used to control brush, after a

perimeter firebreak is mechanically cleared, are strip firing, center firing, and edge firing. These techniques are ticklish and should not be conducted without prior experience and expert supervision. Permission and cooperation of local fire departments are usually required. Burning is unpredictable because a slight change in wind direction can change an adventure into a calamity. Burning causes unsightly charred ground from which new brush growth sprouts. Burning destroys valuable ground cover also.

Girdling is the process used by the early settlers. This is an energy-saving way to kill a tree, but it takes several years to kill large ones. By removing the bark and the phloem (conducting cells which transport food from leaves to root storage), a person can starve a tree because the girdled part prevents food from being stored. The second year, girdled trees will have less reserve food to help it leaf out in the spring. By the third year, it will generally be dead. In species capable of sprouting from roots or from the root collar, sucker growth is encouraged by girdling. Sucker growth increases stem count and produces more brush. As we will see, this same principle can be used in conjunction with chemicals, and the whole task takes less time and is more complete because chemicals kill the roots too.

Chemical Results More Complete

In addition to advantages of less time and less hand labor with the use of chemicals, which have already been pointed out, we can state that chemicals more safely insure complete results over a reasonably long period of time before a treatment program is again needed.

Several chemical methods are used. Among them are foliage sprays, treatment of bark and soil around small tree bases, application of chemical into cut in bark, and application of oil solutions onto uncut bark of dormant plants in winter.

On small brush, short to medium height where density is medium to heavy, foliage sprays

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Since brush is often classified under the category of "small trees," most identification texts will deal with trees and must be adapted for use with young trees.

Some of the important points to be learned for identification are: leaf shape, habit of growth, general form of branches, markings on bark, and form of new twig growth.

Following are some helpful source books for tree and brush identification.

Collingwood, G. R., and W. D. Brush, *Knowing Your Trees*, American Forestry Association, 1962.

Coker, W. C., and H. R. Trotten, *Trees of the Southeastern States*, Univ. of N. C. Press, 1934.

Dominion Forest Service of Canada, *Native Trees of Canada*, King's Printer, Ottawa, 1949.

Eliot, W. A., *Forest Trees of the Pacific Coast*, G. B. Putnam's Sons, 1938.

Emerson, A. I., and C. M. Weed, *Our Trees, How to Know Them*, J. B. Lippincott Co., 1936.

Graves, A. H., *Illustrated Guide to Trees and Shrubs*, Published by the Author, Wallingford, Conn., 1952.

Green, C. H., *Trees of the South*, Univ. of N. C. Press, 1939.

Harlow, W. M., *Trees of the Eastern and Central United States and Canada*, Dover Publications, 1957.

Hough, R. B., *Handbook of Trees of the Northern States and Canada*, The Macmillan Co., 1947.

Illick, J. S., *Tree Habits, How to Know the Hardwoods*, American Nature Association, 1924.

Mathews, F. S., *Field Manual of American Trees and Shrubs*, G. B. Putnam's Sons, 1915.

McMinn, H. E. and E. Maino, *Manual of Pacific Coast Trees*, Univ. of California, 1951.

Preston, R. J., Jr., *North American Trees*, Iowa State College Press, Ames, 1950.

Sargent, C. S., *Manual of Trees of North America*, Houghton Mifflin Co., 1933.

trichlorophenoxy) propionic acid, is used instead of 2,4,5-T in some dry rangeland states where silvex-susceptible oaks abound.

As a precaution to avoid spray mist drift, it is advisable to abstain from spraying when winds are above 6 miles per hour. Keeping spray pressures below 60 psi prohibits formation of atomized droplets of spray which are easily carried on winds.

One should take the time to recognize the difference between spray mist drift and volatile vapor drift, a problem with use of simple ester formulations. Vapor fumes are most likely to form on hot days. Use of low-volatile forms and amine phenoxy preparations will eliminate the volatility problem, but the responsibility to prevent atomization and mist drift is left with the operator. (See *Weeds and Turf*, Jan. 1963, page W-12).

In the event nearby plants may be affected by drift of volatile fumes of esters, one should select a foliage spray of low-volatile esters or an essentially nonvolatile amine salt form. A completely nonvolatile preparation is the diamine salt forms of 2,4-D and 2,4,5-T called Dacamine-D and Dacamine-T.

Another chemical which can be used to avoid drift problems is ammonium sulfamate (AMS) which is trademarked Ammate X. This is a nonvolatile, non-flammable, inorganic compound applied in a water solution to which a few ounces of wetting agent have been added. It should be applied to undesirable brush only. If applied as an overall area spray, it will inhibit growth of grasses and other desirable ground cover.

AMS is a corrosive compound and should not be left sitting in a spray tank for an extended period. Chemical manufacturer's recommendations for removing residues of AMS from sprayers should be carefully followed after each use. AMS can also be applied in an oil-based formulation. In this form, it is said that corrosion is minimal, but the same careful cleanup procedures should be followed.

A new brush killer which

may be the most economical. Timing is important when spraying leaves of brush.

Best results are obtained in late spring to early summer when brush is still young and tender but is fully leafed out. Later in the summer leaves of many species develop a waxy covering which is more nearly impervious to spray penetration. This condition is known as "hardening off." Although results are less predictable when leaves have hardened off, some operators get results with the use of surface active agents (surfactants) added to their spray mix. Sometimes a small amount of fuel oil (1 to 2%) added to water-based herbicide will increase penetration. Of course, with any foliage application, adequate overall coverage is essential to get good results.

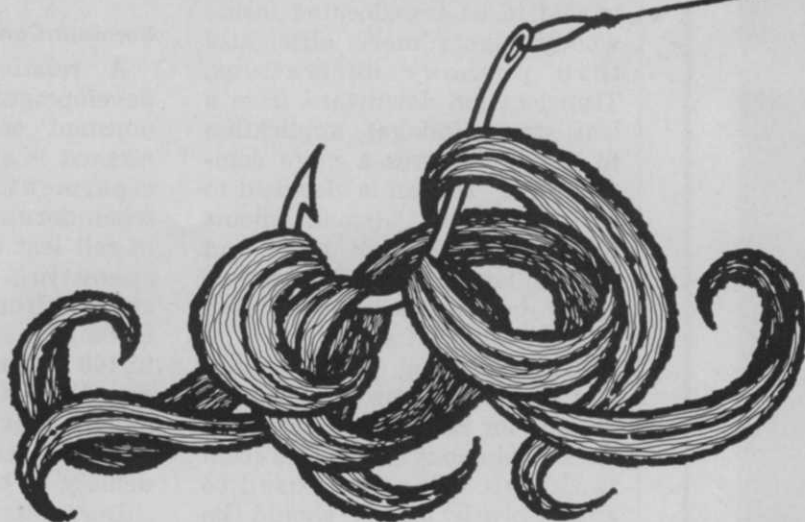
The object of foliage (leaf stem) application is not to kill leaves outright, but permit the

herbicide to be absorbed and moved throughout the woody plant. In this way the whole living system is killed. Surface active agents and oil additives should not be so toxic themselves that they give a rapid top kill.

Foliage sprays become ineffective as soil moisture is depleted late in summer. Soil moisture is essential for control by the leaf stem spray method.

Sprays of the phenoxy compounds, 2,4-D (2,4-dichlorophenoxyacetic acid) and 2,4,5-T (2,4,5-trichlorophenoxyacetic acid), alone or together in equal amounts are translocated throughout plants after having been absorbed by leaves. Four to 8 lbs. of water-emulsifiable esters of the 50-50 mixture of 2,4-D and 2,4,5-T (4 lbs. per gallon formulation) mixed in 100 gallons of water works well when there are no susceptible desirable species in the vicinity. Silvex, 2-(2,4,5-

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could be considered alternative to the use of phenoxy compounds is 4-amino-3,5,6-trichloropicolinic acid, trademarked Tordon. It is said to be translocated inside woody plants more efficiently than phenoxy derivatives. Translocation downward from a leaf stem (foliage) application to the roots gives a more complete kill. Tordon is also said to stifle suckering (small shoots which emerge from roots and root collar around the base of trees) because it is transported to and kills root cells.

After spraying, carefully follow manufacturers' recommendations for removing spray residues of phenoxy herbicides from tanks, etc. Sprayers used to apply brush killers should be restricted to this use and not be used for treatment of lawns, crops, or ornamentals. Phenoxy herbicide residues are very difficult to remove from sprayers.

Basal Bark Treatments

To selectively kill certain brush species and leave desirable shrubs or to treat thin stands of brush it is advisable to use the basal bark treatment method. This method which can be performed any time during the year thus extending spraying season, involves spraying the base of brush and the trunk up to a height of 18 inches with an oil solution of brush killers. Applied to thoroughly wet all sides of a trunk or stem under two inches diameter, the chemical penetrates to the growth layer (cambium) and the tree is "chemically girdled." It will generally be dead the next season.

Six pounds of 2,4,5-T ester or brush killer mixture in which at least half the active ingredient is 2,4,5-T can be applied to the bark in 100 gallons of oil solution. A gallon of spray will treat 100 diameter inches of tree bark. In other words, 1 gallon will treat 50 trees with 2-inch diameters or 25 trees with 4-inch diameters. Chemical should be applied to the runoff point. Spray should run down the tree and saturate the root collar where new sprouts arise.

If both sides of a trunk are

not adequately sprayed, flourishing growth on one side of a tree will be noted the following season.

Dormant Cane Broadcast

A relatively recent proven development of brush control is dormant cane broadcast. This method is similar to basal bark treatment. Brush is sprayed when dormant between the time of fall leaf drop and spring bud sprouting. Leafless brush is sprayed from top to bottom with 6 lbs. of heavy esters of 2,4,5-T in 100 gallons of No. 2 fuel oil or diesel oil. Generally 150 to 200 gallons per acre is sufficient. Rate per acre depends upon the density of brush.

Dormant application kills by prohibiting spring leafing out. Chemical which penetrated to the growth layers is transported to the roots when spring sap begins to flow up and down the trunk.

Several problems are overcome by spraying dormant brush. Normally brush sprayed in the spring becomes brown by midsummer. When spraying is done along highways, it often presents a repulsive sight to passing motorists who see the browned-out foliage.

Dormant broadcast also eliminates danger of drift to susceptible crops because there are no susceptible crops being grown. Larger areas can be treated in less time and lesser volume of spray is needed because there is no foliage to block the spray and resist penetration.

Granular Soil Treatments

Applications which can be made if spraying is not feasible are with either a pelleted form of fenuron called Dybar or with the granular form of picolinic acid called Tordon 10K.

Fenuron is a substituted urea compound which has a high herbicidal activity especially to brush and small trees. Fenuron treatment is effective for thin stands of brush or for use as a followup treatment to stands which have been initially sprayed with foliage herbicide.

Fenuron from the pellets leaches into the soil and is taken

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up by the roots of brush. Rates of application depend upon the species of brush and density and age of stands.

Fenuron is a water-soluble compound and care must be exercised when applying it near any desirable species. Fenuron can "run" and affect trees on the downhill side of the application point. Also since tree roots often travel extensively underground, the fenuron must be applied where it will affect only the target species.

One sticky problem which should be pointed out is that trees of the same species growing near one another often graft roots, in other words they have some roots in common. If an attempt is made to take one and not the other, damage to the "untreated" tree may result, because herbicide is transferred through roots underground.

Pelleted formulations such as Dybar and Tordon prove useful where brush stands are inaccessible to spray rigs. Although the material is applied by hand, which increases labor and time expense, there is no need to make machinery investments.

If desired, both Dybar and Tordon 10K can be applied by mechanical application or by airplane if large areas are to be treated.

Cut Surface Application

When stems or trunks of plants over 4 inches in diameter are cut or wounded before chemicals are applied, treatments act much faster. Chemical is placed in the layer of phloem (conducting cells which transport sap to roots) and the roots are killed quickly. Several methods of cut surface application are presently in use.

With a hand axe, one can make a series of overlapping notches (called a frill) in bark of a trunk. This should be done as near to the ground as possible. Phenoxy herbicide, AMS, or picolinic acid sprays can be applied into the frill. In the case of AMS, fenuron, and picolinic acid, dry crystal or pellets can be spooned into the frills.

Six lbs. of 2,4,5-T herbicide in

100 gallons of oil is a sufficient rate for frill application. AMS liquid is applied at the rate of 7 lbs. per each 2 gallons of water. If crystals of AMS are used, apply 1 to 2 tablespoons for each inch of trunk diameter. Pelleted fenuron and Tordon are used in frills at the same rate as used for basal soil applications.

Use of a water-soluble amine form of phenoxy herbicide instead of oil-soluble ester forms is becoming increasingly popular for treating frills. Water-soluble amine products containing 4 lbs. of herbicide per gallon can be applied without any dilution by using a pump-type squirt can to place liquid into the frills. There are also aerosol products which apply herbicide to frills.

Use of tree injectors to kill medium to large trees eliminates the need to carry an axe and a separate bag, bucket, or can of chemical. A tree injector is a long tube filled with an oil solution using approximately 3½ lbs. of active esters (either 2,4-D, 2,4,5-T, or silvex, depending upon tree susceptibility) for each 10 gallons of solution. An amine form can also be used; it is diluted one to one with water.

The tube has a hard sharp point. The point is rammed into the bark at the base of the trunk; one injection is made for each two inches of trunk circumference. Chemical enters the sapwood and is carried through the tree to both leaves and roots.

Stump Treatment

If one takes the trouble to completely cut and remove a tree in a brush control program, precautions should be taken to see that the stump does not resprout. Saturation application of AMS crystals, picolinic acid, or 2,4,5-T sprays at basal bark concentrations will prohibit resprouting and stump and roots can be completely killed. Stumps with very thick bark should be given a few axe cuts very near ground level.

Sprouts which do emerge from stumps are usually very hard to kill because the small bush has such a large supporting root system. Some species which resprout from the roots rather than

from the root collar region around the base of the stump will be very difficult to control. Several years of foliage sprays may be required to completely kill these. Some root sprouters are aspen, sumac, black locust, and sassafras.

There are a couple of special-use chemicals which should be mentioned. Amitrole at 1 lb. (50% formulation) per 10 gallons of water with ½ oz. of spreader sticker added is an excellent control chemical for poison oak.

Certain polychlorobenzoic acids are considered highly effective against woody brush which has a vining habit of growth.

Application Equipment

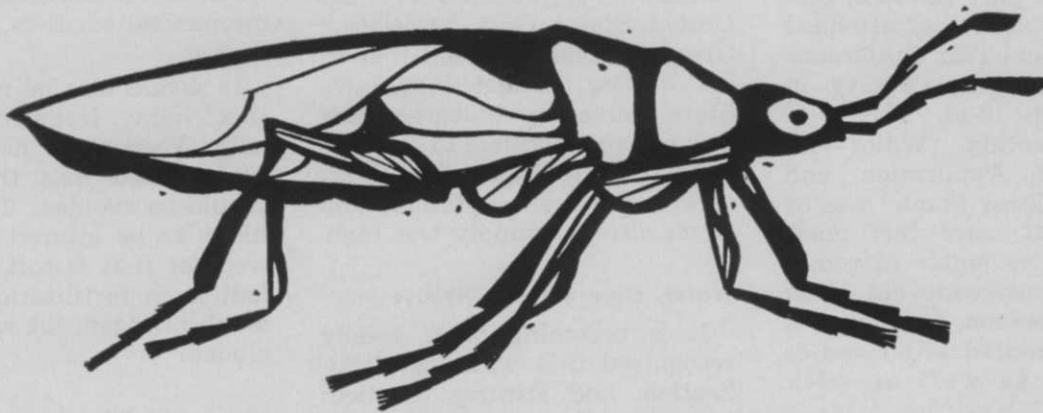
As the reader has probably noticed equipment for brush control varies widely. There are many chemical formulations and just as many ways to apply them.

Following is a summary of some of the more familiar equipment:

- a spoon or scoop
- pump-type squirt can
- knapsack sprayer
- compression hand sprayer
- tree injector
- truck-mounted spray rig with booms and/or hand gun
- airplane or helicopter mounted with spray boom or granular applicator
- helicopter mounted with attachment for applying invert emulsion (See *Weeds and Turf*, Jan. '64, page 12)
- truck-mounted mist blower for dormant low-gallonage spray
- back pack mist blower to apply invert emulsion.

With the many types of application and chemicals available, alert operators can profitably meet the demand of the brush control market.

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"How to Use Water in Turf Management"

Attracts 275 to 30th Iowa Conference

By DR. ELIOT C. ROBERTS

Turfgrass Research Specialist, Iowa State University, Ames

Over 275 men and women who make some phase of turfgrass management part of their professional responsibility attended the 30th annual Turf Conference at Iowa State University in Ames, March 10-12. Theme of the 1964 meeting, "Water—Its Procurement, Application, and Use by the Grass Plant," was of keen interest since turf managers often encounter extremes in natural moisture levels. Even within one season, turf experts may be confronted with excesses of moisture as well as with drought.

Key points in maintaining turf during periods of excessive rainfall were emphasized by Dr. James R. Watson, Agronomist with Toro Manufacturing Co., Minneapolis, Minn. He stressed the importance of being able to get water through a soil or off the surface without keeping the turf waterlogged for long periods of time.

Need Porous Soil

Soil must be sufficiently porous to provide good internal drainage and graded so that surface runoff will not be hindered by low spots. Soils which tend to be wet compact easily when turf is used for normal recreational activities. Aeration with machines that remove a core of soil and surface spiking help to promote better growth of grass under these conditions, the Toro official commented.

High Humidity Spurs Fungi

Dr. Houston B. Couch, Plant Pathologist at Pennsylvania State University, College Park, explained that there's nothing disease-causing fungi in turf like better than conditions of excess water and high humidity. Under these conditions, watch out for disease.

The type of disease that de-

velops will depend on whether it's warm or cool. Jerry H. Cheesman, Agronomist with the United States Golf Association Green Section, reported that in his studies conducted at Iowa State University bluegrass turf was more susceptible to *Helminthosporium* leaf spot when moisture levels were optimum and when nitrogen supply was high.

Water, Lime Affects Disease

It is becoming more widely recognized that watering, fertilization, and liming practices have an influence on the development of turf that make it either more or less resistant to several disease-causing organisms.

Professor Ted L. Willrich of the Department of Agricultural Engineering at Iowa State University outlined geologic processes that have resulted in the formation of water-bearing gravel and rock deposits.

Before attempting to solve problems of water shortages with expanded irrigation facilities, it is necessary first to determine the quantity of water needed and then to locate a source that will provide this amount.

Impound It or Pump It

In some areas the impounding of surface water is most practical. In others, water must be pumped from driven or dug wells. Local regulations on procurement and use of water must be followed.

Even where water is generally plentiful there are some years when shortages exist and turfgrass irrigation must be curtailed. In other locations watering of golf course fairways and irrigation of park and other large turf acreage is not practical.

Importance of encouraging deep root penetration of turf-

grasses was discussed by Tom Mascaro, president of West Point Products Corp., West Point, Pa. The deeper roots go into the soil the greater the volume of soil available from which moisture and plant food can be extracted, Mascaro observed. Roots penetrate compacted soil with difficulty, but when soil is loosened by use of mechanical aerifiers, roots grow deeper.

It should also be remembered that light, frequent watering helps keep roots near the soil surface and thus this practice should be avoided. Turf is more likely to be injured by hot dry weather if it is soft and succulent from fertilization with too much nitrogen, the speaker concluded.

Check Sprinkler System

In the final analysis, whether or not turf gets the amount of water it needs often depends on the adequacy of the sprinkler system, according to C. H. Dolan of Johns-Manville, who discussed problems of water use. Even distribution of water is important in producing a uniform turf. Such factors as sprinkler sizes, specifications and placement, pipe sizes and specifications, and pump specifications determine how evenly the water is placed over the turf. In some instances an under-designed system makes growth of grass more difficult than no system at all. An investment in high quality fine turf should always be protected by an irrigation system designed to meet the needs of the grass.

It has been estimated that about 70% of the problems which arise in turfgrass management are related to too much or too little water. Since water is essential for plant growth the turf manager cannot escape the responsibility of getting rid of excesses and of finding and applying more during times of shortage. Those who are most successful at these times give credit to a properly maintained and healthy turf for an assist in helping them survive periods of adversity.



Diversity of the turfgrass industry was evidenced by this gathering of Minnesota conferees. Left to right are John Kinkead, National Mower Co., St. Paul; George Bock, a maintenance superintendent from Robbinsdale; Andrew Windsperger, a school grounds supervisor, also from Robbinsdale; and Carl Wiebold, head engineer and maintenance supervisor, Mapleton Schools, Mapleton, Minn.

Share Your "Secrets," Experts Urge 300 Turf Pros at Minnesota Course

By JOSEPHINE B. NELSON

Extension Assistant Editor, Institute of Agriculture
University of Minnesota, St. Paul

"Share your mistakes, your successes, your secrets."

That was the gist of the advice given to turf managers by Ray Keen, Professor of Horticulture at Kansas State University, Manhattan, during the University of Minnesota's first Turf Management Short Course on March 17.

The short course was attended by some 300 people professionally interested in the care and management of turf for golf courses, sodding, parks, institutional grounds, and recreational areas. D. B. White, Assistant Professor of Horticultural Science at the University of Minnesota, was program coordinator.

"Mistakes in the art of main-

tenance can be fatal—to the grass at least," Keen told the turf managers. "We don't have time to make all the mistakes that can be made. Share your mistakes with others. Confession is good for the soul and the pocketbook in mistakes avoided. A wise man learns from the mistakes of others. That's why, if you share your mistakes, your successes, your secrets, you'll find your profession and your professional status will both grow!"

Seedbed Preparation: First Step to Good Turf

Proper seedbed preparation for turf seeding or sodding requires advance planning, according to George Blake, a professor in the Department of Soil Science at the University of Minnesota.

There are great risks to spring and summer plowing of fine-textured soils, Blake told the turf managers. The decision to plow and plant spots in early spring that were tromped out the year before usually results in a seedbed that is poor in structure and that puddles with the first rains. Although sandy soils can be tilled almost any time, clay soils will be best for seeding if they are plowed in the fall. If spring

seeding is not feasible, a green manure crop plowed under in midsummer will keep the seedbed in good condition for late summer seeding.

Before preparing a seedbed for large areas, give attention to drainage, surface leveling or grading, to lime where needed, and to fertilizer needs, Blake advised. Calcium from lime and phosphorus are the two elements that move very slowly in the soil and are best added before tilling and worked into the seedbed.

If the soil is tilled when it is too wet, great damage can be done to the seedbed. Seedbed preparation when the soil is at the proper moisture content is essential to a good seedbed.

Special soil mixtures may be needed in spots where there is a great deal of traffic. These can



Science and industry combined brains in this meeting between Edward Frederick (left), superintendent of the Southern School of Agriculture and Experiment Station, Waseca, Minn., and Charles Lenhart, St. Paul sales rep for the Toro Co.

be specified only after the sand, soil and peat ingredients are tested and the mixture quantities specified.

Seeding Techniques

In discussing the hows and wherefores of seeding and sodding, Professor White recommended seeding grasses at the following rates:

Bluegrasses—2-3 lbs./1,000 sq. ft.

Creeping red fescues—3-5 lbs./1,000 sq. ft.

Bluegrass-creeping red fescue mixtures—3-4 lbs./1,000 sq. ft. Ryegrass should make up no more than 10% of the mixture.

Mix seed well before sowing. If you sow by hand, divide the seed into four equal lots. Sow



Mutual turfgrass problems were discussed by delegates George Rostron (left) of Shorewood Nursery in Excelsior and T. Geron Bell, park superintendent, North St. Paul.

Common Ragweed (*Ambrosia artemisiifolia*)



Common ragweed (left) is an annual, reproducing by seed only. It is widespread throughout North America in fields and waste places. Each fall, ragweed produces large stocks of irritating pollen which contribute to the suffering of "hay fever" victims. A second species, giant ragweed (*Ambrosia trifida*) (right) is also an annual and an equally bothersome pollen producer. Giant ragweed has large, hairy, three-lobed leaves; common ragweed has hairy, multilobed leaves, each with a distinct midrib.

Stems are similar in both species: coarse, rough, and hairy. Giant ragweed has stiffer hairs. Height of common ragweed seldom exceeds 4 feet, but giant ragweed can attain 18 feet in moist fertile soil. Mature woody stems and stubble of both species persist into the following spring.

Flowers are unisexual in both species, that is, male and female flowers are found separately on the same plant. Tiny light-green male flowers, which produce pollen, are found in alternating rows on terminal portions of stems. Rows of male flowers are about 6 inches long. Inconspicuous female flowers are found where the leaves join the stems and at forks in stems near the tops of each plant.

Seeds are enclosed in a woody hull $\frac{1}{8}$ inch long. Hulls are ridged with blunt spines surrounding the seed tip. Roots of both species are easily pulled from soil since they are annuals. Roots are classed as taproots.

A third species, perennial or western ragweed, *A. psilostachya*, is a common inhabitant in the Mississippi Valley and westward. It is distinguished from common ragweed mainly by its spreading root-stalks, its occurrence in dense patches, and its finely divided, lobed leaves. It also seldom exceeds two feet height. Flowers and seeds are somewhat similar to other ragweeds.

All of these ragweed species can be controlled effectively with 2,4-D while they are in the fast-growing stage before midsummer. Repeat applications may be necessary. Later attempts at control are unsuccessful because stems become increasingly woody. All three species are susceptible to semi-permanent soil-applied herbicides.

Prepared in cooperation with Crops Research Division, Agricultural Research Service, United States Department of Agriculture, Beltsville, Maryland.

(DRAWING FROM NORTH CENTRAL REGIONAL PUBLICATION NO. 36, USDA EXTENSION SERVICE)

each lot in a different direction.

For sowing mechanically, divide the seed into two lots and sow in two directions perpendicular to each other.

If seed is drilled, it should be drilled in at least three directions. Approximately 10% of the seed should be showing after the seed is covered.

When rolling seed in, do it with a light roller only, White advised. If it is a water-tank roller, it should be no more than a third full.

An area to be sodded should be prepared in the same manner as a seedbed. Sod should be laid across a slope and staked as needed. Joints should be staggered.

If peat sod is used, work some peat into the topsoil before laying the sod.

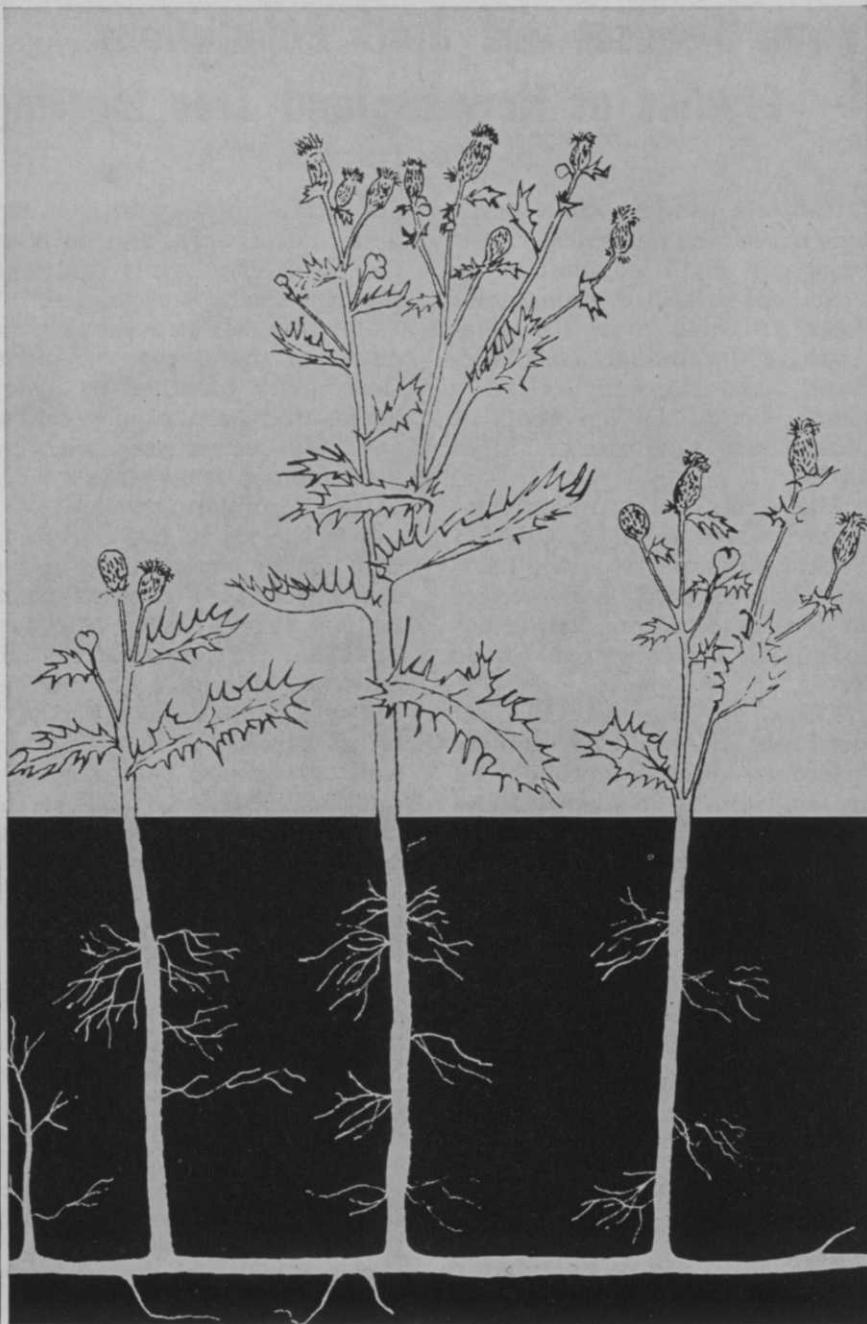
After it is laid, sod should be soaked and then watered well for three weeks or until it is well knit to the soil.

Fertilizer Tips

The highly soluble forms of nitrogen and potash are easily leached from the soil and will burn when improperly applied at high rates. R. S. Farnham, Assistant Professor of Soil Science at the University, warned the group.

Slow-release or controlled-availability fertilizers are relatively new and offer many advantages over the conventional-type fertilizers used on turf grass. Among the advantages of slow-release fertilizers are: (1) a single application may be sufficient; (2) they will never burn if improperly applied; (3) they release plant nutrients when needed; (4) they give uniform grass growth instead of periodic flush periods of growth; (5) they result in less leaching; and (6) they can be stored better.

Slow-release fertilizers for turf include both the organic and inorganic types. Sewage sludge and ammoniated peats are natural organic forms and the synthetics include forms of
(Continued on page 32)



For root-deep control of leafy spurge and Canada thistle use Hooker sodium chlorate

For over 35 years, it's been dependably destroying such pests as Canada thistle, leafy spurge, bindweed, Johnson grass and Russian knapweed.

Hooker sodium chlorate reaches deep into the soil to kill growing roots and germinating seeds. It goes on working for months.

Costs pennies. For only 25¢, you can sterilize 100 square feet of drainage ditch, fence line, or roadway for at least a year.

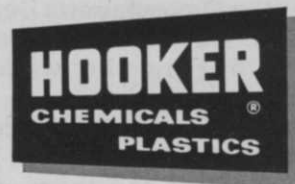
Drum opens fast. Pouring, scooping, or shoveling is easy with the full-open-head drum. A single lever opens and reseals the drum with a metal band.

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rate in drums of 50 and 100 lb. net. Available through agricultural chemical distributors.

Technical aid. Our full-time agronomists can help you with weed-control plans and advise on handling, storing, and using sodium chlorate.

For descriptive folder, or name of the Hooker distributor nearest you, please write Hooker Chemical Corporation, 405 Buffalo Avenue, Niagara Falls, N. Y. Sales Offices: Boston, Buffalo, Chicago, Detroit, Los Angeles, New York, Niagara Falls, Philadelphia, Tacoma. In Canada: Hooker Chemicals Limited, North Vancouver, B. C.



AGRICULTURAL CHEMICALS

Virus Diseases and Moth Populations Studied at New England Tree Meeting

By TERRY STOCK

Subjects ranging from pesticide usage, and numerical trends of gypsy moth populations to virus diseases of ornamental trees attracted over 700 delegates to the annual Tree Wardens, Arborists, and Utilities Conference at the University of Massachusetts, Amherst, March 16-20.

Highlights of the program included a speech by Dr. Johnson Parker, physiologist at the Bartlett Tree Research Laboratories in Stamford, Conn., on "Non-infectious Diseases of Shade Trees."

These various physiological disorders, he said, are climate disorders—disorders brought on by soil problems, and those problems induced by atmospheric disturbances such as air pollution.

Assails Air Pollution

Contributing to air pollution, Parker said, are noxious vapors from exhausts of automobiles and trucks, organic compounds present in smog, and fumes from industrial sites. The nitric oxides from exhausts, Parker explained, give rise to ozone in the presence of sunlight and oxygen, and excess ozone causes leaf damage.

According to Dr. Parker, air pollution is the latest in a series of increasingly numerous physiological disorders, or noninfectious diseases, that are troubling trees in urban and suburban communities. These disorders account for fully 50% of all tree ailments, he noted.

"Policies of the Moth Superintendent's Duties," was the title of a speech delivered by Charles S. Hood, chief superintendent of the Bureau of Insect Pest Control of the Massachusetts Department of Natural Resources, Boston, during the weeklong program.

"There is a vast difference between the duties of the local superintendent and those of the tree warden. The tree warden's

duties include very little if any pest control work, and he is an elected official, while the moth superintendent is appointed."

Hood further stressed that the duties of the Bureau of Insect Control are governed by policy based on reason as opposed to specific recommendation, and that common sense plays a large part in formulating policy.

It is the job of the Bureau to help rid the communities of diseased trees, but suggestions in method vary with the situation. The final decision is usually left up to the individual community.

For example, Hood said, "DDT or methoxychlor work equally well as dormant sprays against elm bark beetles. DDT is the cheaper of the two, but the community may prefer to spend more money and use the insecticide less toxic to other forms of life—namely Methoxychlor."

Speaking on "Some Trends in Municipal Government and Administration," Dr. Robert A. Shanley, assistant director of the Bureau of Government Research at the University of Massachusetts, said, "American municipal government has been shaken to its roots by galloping urbanization over the past 20 years."

Shanley explained that trends have shown a preference for consolidating parks and recreation into one department rather than having separate departments.

"One trend of particular concern in Massachusetts," he noted, "is the loss of existing city park land. In Boston, for example, park land has been dwindling at an estimated rate of 5% per year, and 412 park land acres were transferred from 1952-1962.

"It is difficult to retain existing park and recreation acreage and to secure adequate recreation space for future urban needs," he concluded. "Federal encouragement through soundly administered urban renewal programs can do much to redress park attrition."

In his speech, "Shade Tree Pest Control for 1964," Clifford S. Chater of the Shade Tree Laboratory, Waltham Field Station at the University of Massachusetts, presented information about the most common pests which attack trees and the methods being used to control them. The birch leaf miner and the elm leaf beetle may be controlled by the application of carbaryl (Union Carbide's Sevin), but the application must be precise, he warned. This chemical may also be used to control fall cankerworms, as may DDT and methoxychlor; however, the larger the worms become, the more difficult they are to kill.

"Salt Injury to Roadside Trees" was the topic presented by Avery E. Rich, pathologist from the University of New Hampshire. He told of a recent study on 550 maples along U.S. Highway 4 in Northwood.

"The study significantly showed," he said, "that there was an inverse relationship between distance from the road and salt injury symptoms." The results of this and other experiments indicate that "salt plays an important role in maple decline in New Hampshire. Most of the injury occurs to trees within 30 feet of the edge of the pavement."

Richard E. Abbott, arborist with the Central Hudson Gas and Electric Corp. of Poughkeepsie, N.Y., said, "Trees are a major cause of interruptions to electric service, particularly during storms when falling trees and branches may account for upwards of 90% of the interruptions to electric service. Therefore, the primary functions and duties of a utility arborist should contribute to an improvement of electric service continuity."

The conference was sponsored by the Massachusetts Tree Wardens' and Foresters' Association in cooperation with the Electric Council of New England, the Massachusetts Arborists Association, the New England Telephone & Telegraph Co., and the University of Massachusetts Departments of Entomology and Plant Pathology.

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New Snow S-2C Airplane Said to Be Greatly Improved

A new, wider wingspan is the basis of greatly improved performance in the 1964 Snow S-2C agricultural airplane, reports its manufacturer, Snow Aeronautical Corp.

Featuring new wingtips designed specifically for low-speed flying and larger ailerons for better maneuverability, the new S-2C can be safely turned in less time, allowing the operator to profitably serve growers with smaller fields. The larger ailerons are balanced to give exceptionally light stick forces, Snow says.

An additional 4½ feet of wing combines with the S-2C's new tips to permit shorter take-offs, better climb and glide characteristics, and a lower stall speed. This permits the operator to use the heavy-load-carrying S-2C on smaller fields, providing better coverage for the grower, it is reported.

Modern lines of the plane give the pilot the necessary overall good visibility for maximum safety in ag-operations. There is a choice of engines (450 or 600 hp, Pratt & Whitney).

A complete line of dispersal equipment is available for the S-2C which is engineered for quick, easy changeover to permit use of the best suited system for each particular job, whether for seeding, dusting, fertilizing, or spraying.

For a color brochure and more information write Leland Snow, president, Snow Aeronautical Corp., Box 516, Olney, Texas.



The New Snow S-2C agricultural airplane offers ag-operators and growers a wider, more uniform swath resulting from the increased span and new wingtips. Designed specifically for aerial application use, the single low wing combines the best features of downwash and vortex action to evenly distribute spray or dust, Snow reports.

Meeting Dates



International Shade Tree Conference Western Chapter Meeting, Ben Franklin Hotel, Seattle, Wash., June 21-24.

Hyacinth Control Society Fourth Annual Meeting, Holiday Inn, Tallahassee, Fla., June 28-30.

American Society of Landscape Architects Annual Convention, Hotel Baker, Dallas, Tex., June 28-July 1.

American Association of Nurserymen Annual Convention, Statler-Hilton Hotel, Boston, Mass., July 19-22.

International Shade Tree Conference, Shamrock Hilton Hotel, Houston, Tex., August 15-21.

National Agricultural Chemicals Assn. Annual Convention, The Greenbrier, White Sulphur Springs, W.Va., Sept. 8-11.

Midwest Regional Turf Field Days, Purdue Univ., Lafayette, Ind., Sept. 14-15.

Society of American Foresters Annual Meeting, Hilton Hotel, Denver, Colo., Sept. 27-30.

USDA's New Lab Set

A regional weed research laboratory will be established at Stoneville, Miss., USDA Secretary of Agriculture Orville L. Freeman announced recently. Site selection and other preliminary discussions are currently underway.

The new laboratory is expected to be in operation in 1966, and will be the center from which USDA will make a concerted attack on weed problems in the South.

Report on Aerial Application of *Bacillus Thuringiensis*

Connecticut Experiment Station tests of a new formulation of *B. thuringiensis*, Thuricide 90T, showed variable results in a 250-acre trial last summer in Portland. Larvae of the gypsy moth and of geometrids, or loopers, were numerous in the test area of Meshomasic State Forest.

Entomologists Charles C. Doane and Stephen W. Hitchcock of the station report that one gallon to the acre of Thuricide 90T, applied from a helicopter, controlled defoliation rather well in one 50-acre plot but was less effective in a nearby plot.

Drs. Doane and Hitchcock suggest that the uneven effect of the sprays may be partly explained by cool weather in mid-May following 10 warm days.

Reports from responsible sources indicate there was no immediate effect of the spray on aquatic insects, the bird population, or small animals.

A complete report on 1963 tests of *Bacillus thuringiensis* is

available as Bulletin 665 of the Connecticut Agricultural Experiment Station, "Field Tests With an Aerial Application of *Bacillus thuringiensis*." Address requests to Publications, Box 1106, New Haven, Conn. 06504.

Lethelin Offers Borer Killer

Lethelin's new Borer Killer Concentrate is now available to those who are faced with a widespread borer problem. This product contains 95% active material of which 20% is lindane.

It is mixed with either hard or soft water and sprayed or painted on the infested trees or shrubs.

For information write to Lethelin Products Co., Inc., Mt. Vernon, New York.

CSEA to Meet July 28-Aug. 1

The 38th annual conference of the California School Employee's Association will be held July 28 through August 1, 1964, in Long Beach, California. Special emphasis on turfgrass maintenance



The new lightweight fiberglass tank is designed to provide mobile storage of water and chemical solutions. Available in 40, 80, 150, 200, 300, and 550-gallon capacities, the tank has covers constructed so that hose reels and pumps can be mounted to form compact units. For information write Plastic Products Div., The Ansul Co., Marinette, Wis.

nance will be stressed during Education Day, Friday, July 31.

During a morning session of the association, July 31, Clifton C. Willoughby will be chairman of the Committee on Gardening and Grounds. A talk on turf fertilization is to be given by Howard H. Hawkins, past president of the California Fertilizer Association and a former member of the California Soil Improvement Committee.

Triple-Action CHLOREA[®] GRANULAR MOST POWERFUL WEED & GRASS KILLER

A dry, granular combination of 3 proven chemicals . . . for use around buildings, storage yards, parking lots, fences and other areas where complete, long-lasting control of weeds and grass is needed. Requires only 1 to 1½ pounds per 100 square feet . . . easily applied by hand or with mechanical spreader. Saves labor . . . improves maintenance . . . prevents vegetation fire hazard.

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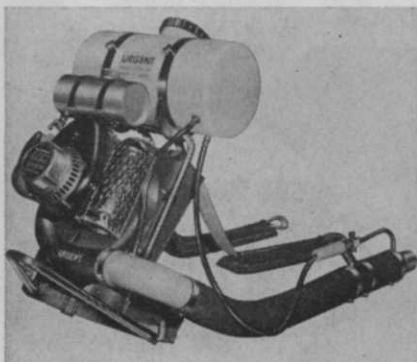
The New No. 101 "King Kemp" shreds up to 101 cubic yards of wet or dry soil an hour. Kemp shredders are used for topsoil, bedding, litter, mulch, and other materials requiring quick, uniform shredding, grinding or pulverizing.

Kemp Shredder Has High Output

The new No. 101 "King Kemp" has a capacity of up to 101 cu. yds. an hour and is now being offered topsoil suppliers, turf supervisors, contractors, and other users. "No matter how fast you load the feed drum, the shredding drum will not be overloaded," says Lyman N. Kemp, president, Kemp Mfg. Co.

Hanson Imports Power Sprayer

Hanson Equipment Co. is now the exclusive importer of the Saturnus "Urgent" power knapsack sprayer, it was announced recently by Howard C. Hanson, president of the firm. Distribution of the sprayer is through farm equipment wholesalers who are currently selling the Hanson



The Saturnus "Urgent" knapsack sprayer which is imported by Hanson Co. of Beloit, Wis., is latest entry into this line of equipment.

The shredder processes both wet or dry soil, and has synchronized feed and shredding drums that assure evenly shredded and blended soil. It throws soil up to 25 to 30 feet for stockpiling, automatically separating stones and hurling them beyond the soil pile, Kemp says.

Complete information is available from the company at 750 Kemp Bldg., Erie, Pa. 16512.

line of agricultural spraying equipment.

The "Urgent" sprayer is manufactured in Holland, and is a self-contained and portable mist unit for agricultural spraying application. The sale and complete parts and service facilities are being developed by Hanson and will include the United States and Canada.

Full details may be obtained from the company at Beloit, Wis.

Rhodia Introduces "Crylde"

"Cryldé," a new material that reportedly protects the fruits and flowers of shrubs and trees from bird depredation, is now available from Rhodia, Inc.

Similar to a spider's weblike mesh, Cryldé is said to be resistant to wind, weather, and soil. It can also be used on newly seeded lawns and home gardens. Write Rhodia, Inc., 60 East 56th St., New York, N.Y., for data.

Suppliers Personnel Changes

Amchem Products, Inc., announced recently that it has added George G. Johnston to its sales staff in order to better serve the dealers and distributors of its agricultural chemicals in the state of Arkansas. Johnston was formerly with Pennsalt Chemicals, and is a member of the Louisiana Turf Grass Assn., the Agricultural Assn. of the same state and the Arkansas Pesticide Assn.

California Chemical Co. recently named L. R. Hamilton as Assistant National Sales Manager-Fertilizer for its Ortho Division. With Calchem for ten years, Hamilton was previously assistant to the manager of supply and distribution. His new responsibilities will include sales of fertilizers manufactured at Richmond, Calif.; Kennewick; and Fort Madison, Iowa. The company also appointed William Hancock as sales representative for its Ortho Division; he will handle sales of pesticides and fertilizers for garden and home use in Nebraska and Iowa.

Morton Chemical Co., a division of Morton Salt Co., has appointed Dr. Raymond P. Seven to be general manager of its Agricultural Department. Dr. Seven, formerly assistant general manager of this department, will continue his active supervision of Morton's expanding activities in the marketing of agricultural chemicals.

Pennsalt Chemicals Corp. has assigned Dr. Edward E. Ivy to their technological center near Philadelphia, Pa., where Dr. Ivy will serve as entomologist, Technical Development Department. Named to a newly created position by Pennsalt is Benjamin J. Stonoga who is Product Manager, BK/Pennswim Department, Chemical Specialties Division.

United States Borax & Chemical Corp. in the Pacific Northwest, headquartered in Portland, now has Ronald B. Pearson as a sales representative. Pearson succeeds G. L. Holt who recently was transferred to Chicago and named Midwest technical representative-plant food development.

Ky. Weed Control Researchers List Materials for Turf Work

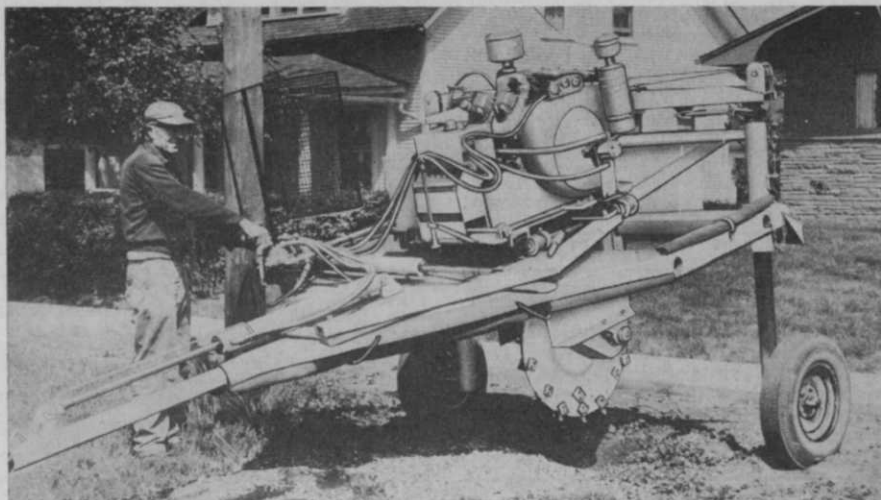
Materials used last season for control of grass and broadleaf weeds in turf were discussed recently by James Herron, University of Kentucky Agricultural Experiment Station weed control specialist.

Here are the findings, with emphasis on recommended materials, test data, and promising materials:

Crabgrass: (Preemergence) Betasan was the most promising new material of several used in this category. Dacthal will be the recommended material this year, as well as Bandane, Zytron, and calcium arsenate. Herron thinks preemergence treatments are best.

Postemergence: Not considered the best way to control crabgrass, but nevertheless frequently used. Materials containing disodium or amine methyl arsenates will be recommended.

Nimblewill: Liquid Zytron did best in tests and will be the recommended material again. Lorox



Vermeer's new stump cutter, powered with a 60-hp engine, is capable of ripping out stumps down to 15 inches below the ground, according to the Vermeer Mfg. Co., Pella, Iowa. The firm now offers six different models from 18 to 60 hp. The new Model 1560 has easy maneuverability for handling in enclosed areas.

at low rates showed some promise, with top kill of nimblewill and no injury to adjacent bluegrass.

Knotweed (Broadleaf of the smartweed family): Dicamba and Zytron appear most promising. When applied in 1962 these materials still had some residual effect in 1963 tests. Tordon, used

at low rates, showed some promise and will be checked out at higher rates.

Chickweed and henbit: Amine and Lithate, formulations of the old standby, 2,4-D, controlled henbit but not chickweed. Silvex, Dicamba, and Kloben gave good control of chickweed when used in postemergence fashion.

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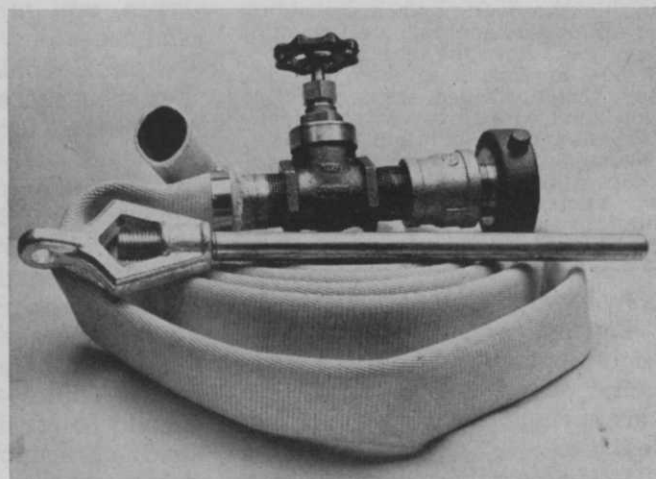
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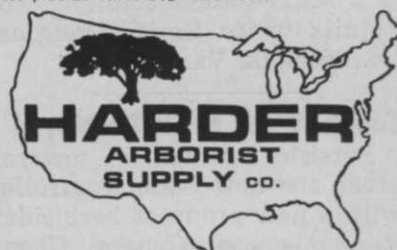
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OUR COMPANY is now operating in termite and pest control. We wish to expand into weed control, turf maintenance, tree care, etc. If you qualify to form and manage this new department, kindly give education details, experience, reference and personal data. Write Box 512, Havertown, Pa.

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TO EMPLOYERS who advertise for men! The letters you receive in answer to your advertisements in WEEDS and TURF are submitted by each of the applicants with the hope of securing the position offered. When there are many applicants it frequently happens that the only letters acknowledged are those of promising candidates. (Others do not receive the slightest indication that their letters have even been received, much less given any consideration.) These men often become discouraged, will not respond to future advertisements and sometimes even question if they are bonafide. We can guarantee that every advertisement printed in WEEDS and TURF is duly authorized. Now won't you help keep our readers interested in this advertising by acknowledging every application received, even if you only return the letters of unsuccessful applicants to them marked, say, "Position filled, thank you"? If you don't care to reveal your identity mail them in plain envelopes. We suggest this in a spirit of helpful cooperation between employers and the men replying to Help Wanted advertisements. Put yourself in the place of the other fellow.

New Lawn Food Is Introduced

Nutro F/85 Turf Food, a new, high-nitrogen turf fertilizer, is being offered for the first time this spring by the Smith-Douglass Co.

It is also reported that Nutro F/85 has a "disciplined" feeding ability that makes grass green up fast, yet keeps it that way for weeks. It can be applied dry, or as a water-soluble solution. For details write Smith-Douglass Co., Norfolk, Va.

Tough Weeds Easily Destroyed

Persistent weeds in noncrop areas are now being controlled with a new group of herbicides. Researchers at General Chemical Div., Allied Chemical Corp., say that the herbicides attack

weeds through the root systems, giving long-term control.

The weedkillers, new formulations of Urox, are applicable for industrial sites, railroads, highways, and other noncrop areas. According to the company, Urox 'J' is adapted for destroying Bermudagrass, crabgrass, and Johnsongrass. Urox 'D' is aimed at most annual and perennial grasses and broad-leaved weeds.

Hard-to-kill grasses such as quackgrass and broomsedge are targets for Urox 'H'. For more details write the company at 40 Rector St., New York, N. Y. 10006.

Minnesota Turf Conference

(from page 24)

urea-formaldehyde produced by chemical companies.

Special slow-release nitrogen compounds and coated soluble fertilizers are inorganic types. Many of these slow-release fertilizers are still in the experimental stage but some may be available soon. The sewage sludge and urea-formaldehyde types are presently available and are widely used on turf.

Annual applications of nitrogen, phosphorus, and potassium are needed for vigorous growth of turf. Because of the high nitrogen requirement of turf relative to phosphorus and potassium, and because of high leaching losses and other losses of soluble nitrogen from the soil, this element should be applied in excess amounts. Often two to four times as much nitrogen should be applied as phosphorus and potassium, particularly where grass clippings are removed, as on a golf green. Fertilizer grades such as 20-5-10, 16-8-8, or 20-10-10 are commonly preferred. Supplemental nitrogen may be applied as a liquid or solid any time during the season as needed.

Proper fertilization promotes healthy and vigorous grass and helps produce a desirable color; aids in preventing diseases and in controlling competing weeds; and minimizes damage from extended drouth periods, Farnham said.

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Trans-A-Tainer Collapsible

A variation of its Quik-Bin package has been developed by the U.S. Bulk Handling & Container Co. Called the Trans-A-Tainer, the new product has a built-in pallet base. The upper part, which is collapsible, is of weather-resistant material that gives protection to dry, flowable products such as fertilizers, pesticides, etc., the firm maintains.

The company reports that five Trans-A-Tainers, when collapsed, require a storage area 60 inches high and 44 inches square. For details write the firm at 333 North Michigan Ave., Chicago 1, Ill.

Tordon 10K Pellets Get USDA Clearance for Brush Control

Tordon 10K Pellets have received clearance from the U.S. Department of Agriculture for use in controlling undesirable woody plants. Intended for spot or broadcast treatment of industrial areas, the pellets are available nationally in 50-pound drums. One drum will treat three-fourths of an acre of brush.

Directions call for spring or early summer application before growth begins. Further information can be obtained from The Dow Chemical Company, Midland, Mich., manufacturers of Tordon.

"Meter-Flow" Controls Spray

John Bean Div. has announced a new, lightweight, low-cost pump that reportedly provides accurate control of spray applications in spite of variation in tractor speed. Called the "Meter-Flow," the centrifugal PTO-mounted pump features a fiber-glass-reinforced plastic case and

impeller, and permits pumping heavy wettables, slurries, and nongaseous liquid fertilizers. Delivery rate is 12 gpm at 40 psi.

The pump can be applied as a replacement unit and is also available on the company's line of sprayer equipment. Details are available in Catalog L-1455 from John Bean Div. FMC Corp., Lansing 9, Mich.

Formulate Tedium as EC

A new, more effective weapon against mites has been developed in the emulsifiable concentrate form of Tedium miticide, it was announced recently by Niagara Chemical Division of FMC Corp.

A five-year research program and commercial trials last year show that the emulsion form of Tedium provides more rapid, complete, and longer lasting control of mites than the wettable form of this chemical.

Tedium EC performs best when used on a protective schedule. Commencing early in the season, it prevents mite populations from reaching damaging levels.



Root-Lowell Corp., Division of Root-Lowell Mfg. Company, has announced the introduction of its new "Spraycat" 13000 series power sprayers for application of all sprayable materials with gun or boom. Tank capacities range from 15 through 50 gallons in wheel or skid mounted types. Its new pump is rated at 3 gpm with up to 250 psi. For data, write R-L at 445 N. Lake Shore Drive, Chicago, Illinois 60611.

Niagara reports that field test data indicate Tedium EC superior in performance over wettable powder. In all the work to date there has been no experience of plant injury.

For details write the firm at 100 Niagara St., Middleport, N. Y.

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Aerate or Power Rake turf before you spray or spread weed killers, pesticides, insecticides

Both aerating and power raking open turf so chemicals get into the soil or surface mat faster. You'll also get better chemical coverage...lose less in the air...lose less to run-off from watering or sprinkling. You benefit—and your customers get the double benefit of aerating or power raking plus chemical control!

Ryan Motoraire self-propelled aerator



- Covers up to 10,000 sq. ft. per hour
- Pulls uniform, deep soil cores on 6" centers

Ryan Ren-O-Thin Power Rake

- Cuts through surface thatch
- High speed reel with long-length cutting blades
- Center-mounted engine equalizes weight, minimizes vibration

- Wheel scrapers help maintain cutting depth you set



Ryan Lawnaire aerates and slices, attaches to garden tractor



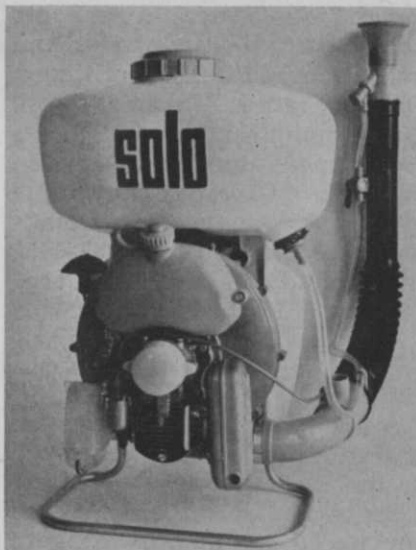
- Choice of tines lets you aerate (like Motoraire above) or slice (aerate without removing cores)
- Riding seat is optional

Better turf preparation means better results from chemicals—and you can mechanize the job with golf course proved—golf course approved Ryan equipment. Write for details:

Manufacturers of aerators, renovators, vertical mowers, spreaders, rollers, and sod cutters.

Ryan EQUIPMENT COMPANY

2055 WHITE BEAR AVE., ST. PAUL, MINN., 55109



Solo's new "Solo Jr." mistblower is said to be easily portable.

Solo Adds Knapsack Blower

A new addition to their mistblower line has been announced by Solo Industries, Inc. Said to be the lightest and most versatile knapsack-type blower in the world, this unit weighs only 15 pounds empty.

Called the Solo Junior, it has a 2½-hp engine that enables it to produce an effective reach of 25 to 30 feet. The air velocity at the nozzle is rated at 250 mph.

Complete data is available from the company at Box 128, Woodside, New York.

Vinyloy Has Smooth-Bore Hose

Vinyloy polyvinyl chloride hose is now available with smooth bore, is lighter in weight, and more flexible, says Vinyloy Hose & Tubing Co. It is produced as a continuous extrusion, reinforced with a spiral of rigid vinyl.

Stocked in many sizes in lengths up to 300 feet, it is available from the company at 8821 Kenwood Rd., Cincinnati 42, Ohio.

Ansul Appoints Southwest

Southwest Solvents & Chemical Co. has been appointed manufacturer's representative for two herbicides, Ansar 184 disodium methanearsonate and its related compound Ansar 170. Manufacturer is The Ansul Co., Marinette, Wis.

Trimnings

A goal for Troll. Prof. Joseph Troll of the University of Massachusetts in Amherst has long been known among turf people as the chairman of his school's fine Winter School for Turf Managers. Now we learn he's got another claim to fame, namely, an appointment to the Green Section Committee (Northeastern District) of the U.S. Golf Association. Professor Troll joined the U of Mass. in 1957, and has been widely recognized for his enthusiastic devotion to turf technology.

Sensitivity in Utah. Salt Lake City has this weed law. City officials want to get rid of unsightly weeds, and are determined to do the work themselves (and bill the landowner) if weeds are not hastily dispatched. But a few citizens questioned whether or not the law was constitutional, since it was felt that public nuisance objects must be related to public health and safety. Not so, says one of the city's legal eagles, who opined "whether a particular annoyance or inconvenience is sufficient to constitute a nuisance depends upon its effect upon an ordinary reasonable man, a normal person of ordinary habits and sensitivities." Well! We dislike weeds as much as the next man (probably more), and our sensitivities are grossly offended at the sight of rampant growths in vacant lots, around signs, and other places where a reasonable, ordinary man is likely to encounter them. It makes us feel quite comfortable that Salt Lake City will probably continue to enforce its weed laws, and thus protect the sensitivities of the fine people of Utah. In all seriousness, it seems to us that uncontrolled weed growths are patently objectionable, to the ordinary as well as extraordinary, and that a person's habits really have little to do with it!

New job for veteran Mancuso. A note from Yonkers informs us that Anthony A. Mancuso has just been named city arborist in that New York community. Tony is a 25-year veteran of tree work, and is a former president of the Westchester County Tree Protective Assn. The winning entrant from a field of three, the New York authority on tree care will succeed John Coyne, who's retiring after 35 years in the job. Congratulations to both!

On the ball in Boise. We've found a number of newspaper clippings in the morning mail the last few weeks about the extensive shade tree spraying program under way in Boise, Idaho. Under the direction of park superintendent Gordon Bowen, the Boise program is a major component of that city's efforts to preserve its stand of fine old shade trees which delight the citizenry all summer long. Huge mistblowers have been pressed into service, and Bowen's crew is systematically covering the city from one end to another. The crew is aiming its efforts primarily at aphids and scale, and we hope they don't encounter any trouble from the beetles (the elm leaf kind, not the English kind).

**AMCHEM Weed Control Programs
save material, lower labor costs,
save time for other jobs**

Many companies have lowered the cost per day of effective weed control—on a full season basis—with an AMCHEM planned vegetation control program. You can save money on profit-robbing maintenance costs, cut fire hazards and keep fencelines and grounds around buildings more

attractive. ■ AMCHEM'S amazing AMIZINE and FENATROL herbicides fight weeds two ways to give you outstanding full season control: 1. Provide the important top kill and move throughout the weeds' system to kill roots; 2. Prevent regrowth from germinating weed seeds for a full season or longer. And both are easy to apply in any standard sprayer—won't corrode equipment. AMIZINE and FENATROL are non-flammable,

odorless and won't stain steel, concrete, etc. ■ It's just adding a weed or brush control technician to your staff when you do business with AMCHEM. Your AMCHEM/MAN can answer your most difficult control problems. ■ Remember, AMCHEM is a pioneer in scientific weed and brush control—originators of 2,4-D and 2,4,5-T herbicides. Find out all the facts about the money and work saving AMCHEM Weed and Brush

Control Programs. Write now for FREE brochures and technical bulletins. Dept. WT-45



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Ambler, Pennsylvania

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Companies are known by the clean fences they keep



Weed Control is a sound business practice

WEEDS!

a menace to everyone / profits for you

There's money in weeds, if you're on the right side of them. And that's with any of the many Du Pont weed and brush killers. They make custom weed control jobs easy and effective. Check the typical problems below; chances are you'll see at least half of them within a mile of where you're standing. ■ The answers are easy, too, because Du Pont has a product to meet almost any weed control situation you'll encounter.



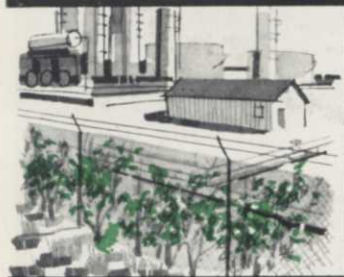
THE PROBLEM:
Hard-to-kill perennials
— Johnson grass,
Bermuda grass, nut-
grass and quackgrass.

THE ANSWER:
Efficient, long-term control of
vegetation with HYVAR® X
bromacil weed killer, an entirely
new organic herbicide.



THE PROBLEM:
Rampant weed growth
in storage areas
causing fire hazards
as well as wood and
metal deterioration.

THE ANSWER:
A single application of KARMEX®
diuron or TELVAR® monuron
weed killers provides effective,
low-cost control of weeds and
grasses for a whole season.



THE PROBLEM:
Deep-rooted perennial
weeds — morning glory,
leafy spurge, Canada
thistle and others.

THE ANSWER:
Easier control of noxious weeds
than ever before with TRYBEN®
200 weed killer. Also
controls some woody plants.



THE PROBLEM:
Undesirable growth of
brush on plant sites,
roadsides, drainage
ditches, rights-of-ways.

THE ANSWER:
Economical control of brush with
non-volatile, AMMATE® X
or with DYBAR® fenuron weed
and brush killer.



Only a few examples of the type of situations that mean opportunity for you are shown above. Product descriptions are necessarily brief, too — each of these Du Pont herbicides effectively control many other kinds of weeds or brush. For complete information mail the coupon to Du Pont today.

On all chemicals follow label instructions and warnings carefully.

Du Pont—I. and B. Dept. WT-54
Room N-2539, Wilmington 98, Delaware

Please send me more information on Du Pont weed
and brush killers.

NAME _____

COMPANY _____

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