

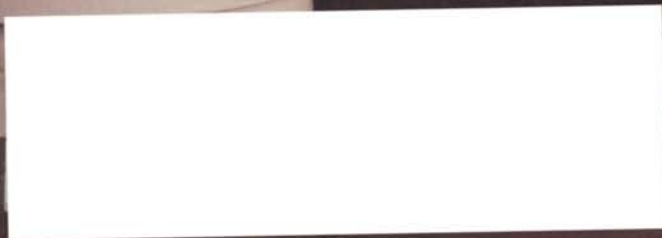
WEEDS TREES & TURF

*Keeping power
highways clear*

ONE DOLLAR • MARCH 1977



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Tank mixing
pesticides





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WEEDS TREES & TURF®

MARCH 1977, Vol. 16, No. 3

14 The Wonderful Power of Selectivity to Power Line Rights of Way — Public awareness of environmental quality and land use adds a new dimension to maintaining power highways.

18 Transplanting Tolerances of Seven Tree Species — Here are the results of a study conducted at Memphis State University on transplanting effects on species of cypress, ash, maple and oak.

20 Tank Mixing Pesticides for Effective Results — This time and labor saving method of application is most successful if precautions are taken.

24 Lime Applications for Soil Neutralization — Here is some practical advice for improving the pH rating of your soil for better turfgrass.

SPECIAL PULL-OUT SECTION — Chemical Lawn Care Industry — This in-depth look at a billion dollar industry covers everything from marketing to management including a survey of the industry, a look at several successful companies and some practical advice for improving your lawn care business.

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ON THE COVER—One important aspect of providing sufficient electric power is proper maintenance of power rights of way. For the newest developments in this area see page 14.

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TO OUR READERS —

This issue marks our first in-depth look at the emerging lawn care industry. When we first discussed the possibility of a supplement we knew: A. there was such a business; B. the names of three of four large companies; and C. one reputable tree company that was expanding its share of the lawn care market. Today we know a whole lot more.

Our information was gathered from a special WT&T survey mailed to over a thousand lawn care industry people, a telephone survey conducted for us, and from extensive investigation by the staff. Assistant Editor Eric Friedman, alone, talked with over one hundred lawn care industry people.

Although it is impossible to personally thank each of the people who helped us compile our information, we would like to extend thanks to the following individuals: Daniel Dorfman, founder of Lawn-A-Mat; Anthony Giordano, founder of Lawn Doctor; Dr. Robert Miller, vice president of research and development for Chem-Lawn; Dr. Roger Funk, director of research at The Davey Horticultural Institute of the Davey Tree Expert Co.; Marty Erbaugh, head of the Davey landscape division of the Davey Tree Expert Co.; and Dr. David Harmon, director of research for Harvest Publishing.

All of the factual information we gathered appears in our supplement. But perhaps the one important aspect our supplement does not stress enough is the importance of quality service. Lawn care is a service-oriented business. No amount of advertising will erase incompetent work. And one of the most important sales tools available is the satisfied customer. This all leads me to an important point — the need for a professional organization.

A professional association can upgrade an industry. It can be a vehicle for the exchange of developments and ideas, and for setting standards for quality and performance. We urge lawn care industry people to form such an organization and extend an offer to help in the formation.

If you are in the lawn care business and agree with us, won't you write to us, expressing your opinions on how the organization should be formed, what its goals should be, and if you would be willing to play an active

role in such a group. We will keep you informed as to the developments in this area through this editorial page in future issues.

Recently we received the following letter:
Gentlemen:

Congratulations on your superb articles concerning irrigation in your January '77 issue. They were not only well written but extremely informative for those who are in the process of evaluating their irrigation needs.

I have one comment to make and this is, if at all possible, in the future could a footnote be added to the end of each article where the reader can write and obtain further information pertaining to the subject material.

Fred Wilochka
Aqua-Matic Lawn Sprinkler and
Irrigation Co.
Longmeadow, MA.

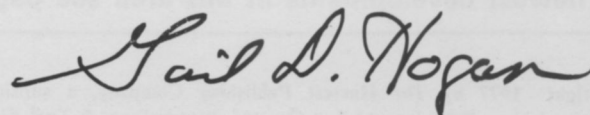
We shall make every effort to comply with Mr. Wilochka's request.

And another letter:
Gentlemen:

How about equal time for us Easterners? I refer to the January issue, page 12, in which you plug "Trees of the Berkeley Campus" at \$5.00.

"Trees in Amherst" a pictorial and descriptive record of native, cultivated and historically interesting trees in Amherst, Massachusetts; assembled and edited by The Tree Book Committee and published by the Garden Club of Amherst, copyright 1975 is an excellent compilation of text and pictures in a plastic three-ring binder. The index leaves out some essential cross references and is somewhat arbitrary, but the closeups of flowers, bark, seeds, etc. are most unusual and very clear.

G. A. Yarwood
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DOLLAR SPOT^{*} (*Sclerotinia homoeocarpa*) on bentgrass.



LARGE BROWN PATCH (*Rhizoctonia solani*).



FUSARIUM BLIGHT (*Fusarium roseum* and *Fusarium tricinctum*).



TYPHULA BLIGHT or Gray Snow Mold (*Typhula itoana*) on a fairway.



TYPHULA BLIGHT or Gray Snow Mold, close-up view.



PYTHIUM BLIGHT or Cottony Blight (*Pythium* spp.).

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Turf Fungicide controls Leaf Spot and Rust. It is also effective against Large Brown Patch.



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^{*}In order to help reduce the possible development of tolerant strains of dollar spot it is recommended that TERSAN 1991 be used in conjunction with TERSAN 75 or another suitable contact fungicide.

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Turf Products

Government News

Regulation of pesticides by the Environmental Protection Agency and, less directly, industry data supporting pesticide registrations and tolerances have been sharply criticized by a Senate subcommittee staff report, the result of an intensive study of the agency conducted last year.

An agency official said "it is probably the most devastating report to hit EPA since it was formed."

The draft report, "The Environmental Protection Agency and the Regulation of Pesticides," stated the inquiry has led to the "unfortunate but clear conclusion that pesticide regulation in the United States is fundamentally deficient."

The report continued:


"Pesticide regulation has failed to include many obvious, necessary and prudent steps that would have better protected the public health and the environment. Moreover, the failure of pesticide regulation is not attributable in any significant way to deficient legislation. Rather the cause lies clearly and unmistakably with the poor administration of the program by the EPA itself. In an almost classic example of poor Government regulation, the EPA's handling of pesticide registration has sacrificed effectiveness at the altar of bureaucratic neglect. For six years, EPA has paid too little attention to warnings of Government investigators, congressional reviews, and even some of its officials."

The staff concluded that a large part of the millions appropriated for pesticide regulation by EPA have been wasted.

EPA issued a USDA exemption to use dimethoate, Guthion, and malathion to control citrus blackfly in Florida's Broward, Dade, and Palm Beach Counties. Maximum allowed use is 45,000 gallons of 95 percent malathion; 1,000 pounds of dimethoate; and 450 pounds of Guthion. Application sites are limited to nursery stock, urban areas, and, if necessary, commercial citrus groves. The exemption expires October 1, 1977.

A recent District Court decision that allowed an employer to require an OSHA inspector to fill out a questionnaire before inspecting the premises has been reversed by the Appeals Court. The Appeals Court says the questionnaire is "patently designed to delay inspection." OSHA inspectors need only to present credentials to be admitted.


The petition for rehearing in the Heptachlor/Chlordane suspension appeal was denied by the U.S. District Court of Appeals. The petition was submitted by Velsicol Chemical Co. In the meantime, cancellation hearings continue.



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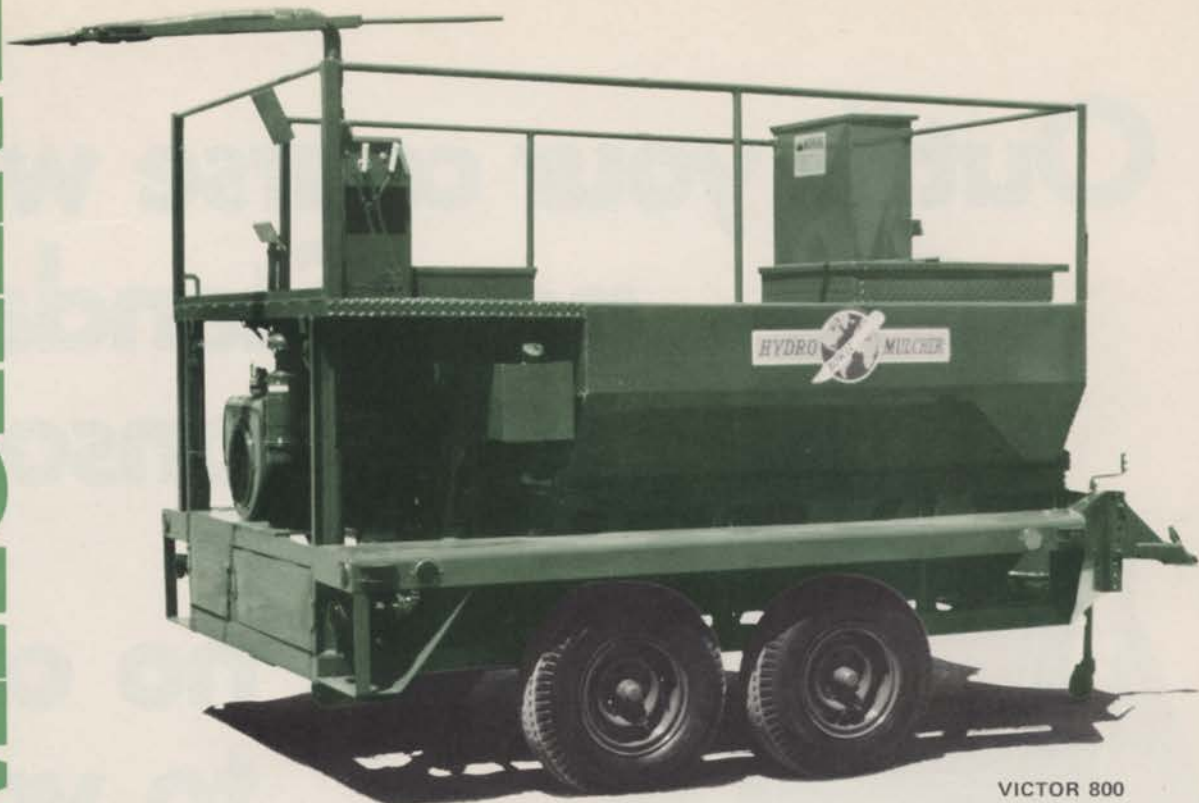
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Industry News

N.H. forest named biosphere reserve

Hubbard Brook Experimental Forest in New Hampshire was recently named a "biosphere reserve", according to a spokesman for the U.S. Forest Service.

The newly-named reserve is part of an international network of protected areas representing the world's major natural regions. In addition to conservation, the areas will be used for research monitoring and education. Five other U.S. sites, all in existing national forests or national parks, were also named biosphere reserves under UNESCO's Man and the Biosphere Program.

Hubbard Brook has served as a watershed research site since 1955, said Robert S. Pierce, Forest Service research forester at Durham, NH. Located in the central White Mountains near West Thornton, Hubbard Brook is typical of many watersheds in New England. That, and the fact that its vegetation is representative of northern hardwood forests, make it an ideal site for research.

Plant to make gas for NH₃ production

W. R. Grace & Co., and Ebasco Services Inc., both of N.Y., NY, will negotiate a contract with the Energy Research and Development Administration (ERDA) to design a demonstration plant for the gasification of coal for generation of synthesis to produce 1,200 tons per day of ammonia.

The plant will be designed to demonstrate the utilization of a wide range of U.S. coal, including high sulphur eastern coals. All local, state and federal environmental requirements will be incorporated in the plant design.

At the conclusion of the Phase I

design, predefined performance and economic criteria for the facility will be established. These criteria will be the basis for determining whether the proposals will continue to Phase II (construction).

Current plans are to locate the proposed coal-base ammonia plant in Basket, KY, in the vicinity of the Green River, six miles from Henderson, KY.

Fisons expands research area

Fisons Corporation has purchased a 300-acre research farm near Harlingen, TX. The farm will be used for specialized testing and screening of herbicides, insecticides, and fungicides produced by Fisons research and development facility in the United Kingdom.

The purchase of the Harlingen research facility is the second major physical expansion for the firm in the past year. The company recently began construction of a pesticide manufacturing plant on a 435-acre site near Muskegon, MI.

Fisons Corporation, headquartered in Bedford, MA, is a subsidiary of Fisons Limited, England, a world-wide manufacturer and marketer of agricultural chemicals, fertilizers, pharmaceuticals and scientific equipment. Fisons Corporation has been conducting agricultural research in the US since 1967.

According to Fisons, the Harlingen location was selected for its year-round growing season, enabling the testing of products on a wide variety of crops.

Diamond Shamrock shows record sales

Diamond Shamrock Corp. achieved record sales, net income

and earnings per share for the fourth quarter and fiscal year 1976. The announcement was made by W. H. Bricker, president and chief executive officer of the diversified chemicals and oil and gas company.

For the 12 months ending Dec. 31, 1976, net income increased 22 percent to \$140.0 million compared with \$114.3 million in 1975.

Earnings per share were \$3.90 based on 34,547,000 average common shares outstanding. This compares with \$3.41 based on 31,344,000 shares outstanding in 1975.

Record sales totaled \$1.36 billion, up 20 percent from 1975.

New insecticide mfg. firm opens

The formation of Fairfield American, a corporation whose insecticide products were formerly made by the agricultural chemical division of FMC Corp. of Middleport, NY, has been announced by Clinton J. Starke, the new firm's president. Starke was formerly manager of industrial sales at FMC.

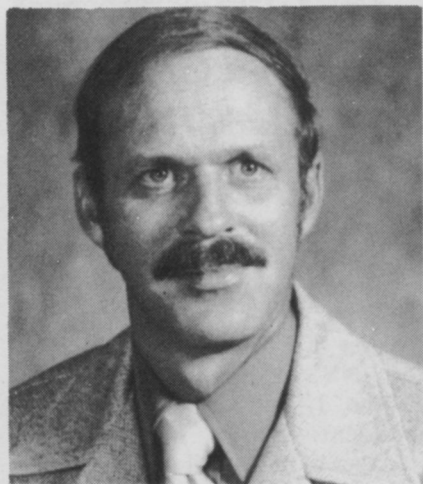
Johns-Manville forms Ag-Turf dept.

The Johns-Manville Corp. is consolidating its agricultural and turf irrigation sprinkler systems business in Fresno, CA, under the name Ag-Turf department. The announcement was made recently by Chester J. Sulewski, senior vice president, industrial and pipe products group.

According to Sulewski, this consolidation will enable the Ag-Turf department to be more responsive to customer needs and to better serve the irrigation market.

People on the Move

James H. Lake has been named president of **Elanco Products Co.**, a division of Eli Lilly and Co. Lake received a B.S. from Bucknell University. He joined Lilly in 1949 and became assistant director of pharmaceutical production in Indianapolis and later director of the Tippecanoe Laboratories in Indiana. He has also served as general manager of the Tippecanoe and Clinton facilities, vice president of the biochemical division and most recently served as vice-president of production operations.



John Sours

John Sours has joined the turf marketing department of the **Jacklin Seed Co.** Sours holds a B.S. in land and water resource development from Michigan State University.

David Simpson has been named technical representative for the Pro-Turf division of **O. M. Scott and Sons** in the Canadian territory east of Toronto. Simpson has extensive background in golf course construction and irrigation.

Paul Dexter, formerly senior market research analyst and district sales manager for the agricultural depart-

ment of The Dow Chemical Co., has joined **Agrotec Services, Inc.**, Salisbury, MD, as field sales specialist. His duties will include covering Virginia and northeast North Carolina. Dexter holds a degree in business administration from the University of Toledo.

Morgan Howard has been appointed western regional turf sales manager for **Rain Bird**. Formerly the district manager for the southwestern region of the United States for Rain Bird, Howard will now oversee the district managers of the western United States.

Lorne R. Dunham has been appointed division manager of **Cole Chemical Supply** of Madison, Wisconsin. Formerly in product development with Occidental Chemical Co., Dunham will be headquartered in Madison.

Toro Co. announces the appointment of **E. S. Newton Jr.**, as director of sales and marketing for turf products. Newton recently completed a special 18-month assignment as director of turf irrigation sales for Toro's irrigation division. Prior to that, he spent 14 years with Zaun Equipment, Inc. of Jacksonville, FL., a full-line Toro distributor.

Thompson-Hayward Chemical Co. announced four branch manager appointments. **Charles P. Jensen** transfers to the Memphis distribution center as branch manager. **J. L. Smith** moves to Atlanta as branch manager, **Phil Kizer** is promoted to branch manager at the Oklahoma City distribution center and **Ray Gibbs** is promoted to branch manager of the Nashville center.

Jensen joined the company in



Charles Jensen

1960 as a warehouseman. Later he served as an industrial sales representative, then branch manager in Atlanta.

Smith has been with the company for 16 years beginning as an office worker then moved into industrial sales and later served as branch manager in Nashville.

Kizer joined the company in 1962 as a laboratory technician. He later served as an industrial sales representative then manager of product marketing in the industrial chemical division.

Gibbs started with Thompson-Hayward in 1970 as an industrial sales representative, a position he has held until his promotion.

The B. Hayman Co. has added two new field representatives to its sales staff. **Don Rodino** will serve as the company field representative in San Bernardino County, Palm Springs and Las Vegas. **Nick Dykman** will serve eastern Los Angeles and Riverside Counties. Both attended Mount San Antonio College.

Allan N. Pavia has been named manager of materials management of the outdoor power equipment division, **J I Case Co.**, based in Winneconne, WI. Pavia joined J I Case in 1964 at the Racine Tractor Plant and most recently served as a supervisor in materials management there.

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The wonderful power of selectivity to power line rights of way

by Charles J. Olenik, supervisor of forestry, eastern division, Pennsylvania Electric Company

In recent years there has been an ever increasing demand by homeowners, business and industry for more and more reliable electric service. To accommodate this increased use, companies such as Penelec have constructed new power plants, stepped up voltages on existing power lines, and constructed new and higher voltage transmission and distribution lines to handle the increasing load.

However, having the facilities to generate and carry the energy produced is only part of the aspect of providing reliable service to the customer. New and existing rights of way that are the "highways" of electrical energy must be maintained to prevent any interruption in the flow of energy. Specifically, interruptions caused by trees or brush reaching conductors thereby causing outages and other major and very costly problems.

At the present time, we as right of way managers have numerous synthetic growth hormones that do a reliable job in fighting the encroachment of undesirable tree species on our rights of way. However, we are also facing a fact of increasing public awareness in the areas of environmental quality, ecology, land use and the value of an undisturbed natural landscape.

This fact adds another dimension to the problem of right of way management. That is, we must maintain our rights of way to provide reliable service and at the same time manage these same areas so as to provide an aesthetically pleasing appearance and a land area useful for wildlife and recreation.

The answer to this problem therefore cannot be just any chemical brush control program. There must be some thought and planning to choose a chemical technique that will provide adequate vegetation control and in addition be economical, safe and aesthetically pleasing. To accomplish this goal we should consider some basic factors that are present on all rights of way:

Conditions existing on the right of way

This information must be gathered by a field survey of the right of way, which means we have

to get out and walk and make some observations to determine:

1. Density of undesirable tree species.
2. Density of desirable vegetation.
3. Height of brush to be treated.
4. Terrain.
5. Access.
6. Agricultural activities in and near the right of way as well as state and federal lands that cross the area to be treated.
7. Population.
8. Main road and highway crossing.
9. Stream and river crossings.

Gathering this information is a major part in making a final decision as to the type of chemical technique deemed necessary.

Consideration should be given to the techniques available and the advantages and disadvantages of each as they relate to the field survey. Some of the methods of application used on Pennsylvania Electric Co. property over the years that have been proven effective are:

Selective basal application

1. All woody plant species in the right of way, except species designated to be left for future ground cover, shall be treated with chemical in oil so as to saturate each stem completely at the ground line and to a height of 12 to 18 inches on the stem and completely encircling each stem. Where sprout growth originates from a stump, the treatment shall also be applied completely around the stump and any exposed roots.
2. Extreme care must be taken to treat only the tall growing tree species.
3. All chemical solutions shall be applied by nozzlemen walking the right of way. The applying equipment may be either power driven equipment or knapsack spray tanks. Spray nozzles shall be adjusted to produce a coarse spray of large droplets at 30 pounds or less pressure.
4. Treatment season shall be year round.
5. All evergreen plants, except those listed, shall be treated over their complete height, including all leaves, twigs, and stems, in addi-

tions to the basal treatment.

6. All stems of ash species over five feet in height shall be removed by completely cutting at the three-inch height. The brush from this mechanical cutting shall be disposed of in a manner acceptable to the property owner. No burning of this brush will be permitted without the approval of the company. Stumps of this brush to be treated in accordance with specifications for selective basal treatment except for height of treatment.
7. The following plants are not to be treated on the right of way:
 - A. All grasses, ferns and herbaceous plants.
 - B. All annual weeds and annual plants
 - C. Low-growing shrubs including:
 1. Mountain laurel
Kalmia latifolia
 2. Sweetfern
Comptonia peregrina
 3. Azalea
Azalea nudiflorum
 4. Huckleberries
Gaylussacia spp.
 5. Blackberry
Rubus allegheniensis
 6. Raspberry
Rubus occidentalis
 7. Spice bush
Lonicera benzoin
 8. Choke cherry
Prunus virginiana
 9. Choke berry
Pyrus melanocarpa
 10. Dwarf willow
Salix humilis
 11. Witch hazel
Hamamelis virginiana
 12. American yew
Taxus canadensis
 13. Partridge berry
Mitchella repens
 14. Wintergreen
Gaultheria procumbens
- D. Small trees to be preserved on the right of way where conductor height will permit:
 1. White flowering dogwood
Cornus florida
 2. Redbud
Cercis canadensis
 3. American hornbeam
Carpinus caroliniana
 4. Shadbush
Amelanchier canadensis
 5. Iron wood

Ostrya virginiana

6. Red cedar
Juniperus virginiana
7. Striped maple
Acer pennsylvanicum
8. American crabapple
Malus coronaria

8. All brush over five feet in height, except the above, located within 100 feet of all improved roads and highways shall be cut and stump treated. The cut brush shall be disposed of in a manner acceptable to the property owner and so as not to be visible from the road or highway.

9. Advantages

1. Selectivity in choosing stems to be treated.
2. Foliage "brown out" can be eliminated with dormant application.
3. Control over application of the chemical solution.
4. Can be applied year round.
5. Most acceptable to the public.

Disadvantages

1. Excessive cost when applied on dense brush.
2. Limitations by terrain and access.
3. May be a problem in obtaining oil.

Water borne, stem-foliage application

1. All undesirable vegetative growth shall be sprayed with a solution of chemical and water so as to completely wet the entire leaf and stem surface until there is runoff; except that evergreen tree species over five feet in height shall be removed by cutting at the three-inch height.
2. Extreme care must be exercised to insure that each plant is entirely covered with chemical solution, both in leaf and stem surface. To accomplish this complete coverage, it is necessary that the nozzlemen treat each plant individually from a position close to the plant. Each plant must be treated from more than one direction.
3. All chemical material shall be applied by nozzlemen walking the right of way. The nozzle opening size shall be No. 9 or

Continued on page 16

the power of selectivity

Continued from page 15

- larger. The nozzle pressure shall not exceed 150 pounds pressure. To assure complete coverage of plants on the outer edges of the right of way, it is necessary that they be sprayed by men walking to the edge of the right of way and directing their spray to the center of the right of way. Off right of way damage is not permitted.
- Pump equipment used to pump or mix spray materials shall not be used to pump water from streams or ponds into spray tanks.
- Chemical treatment is applied between June 1 and August 15.
- Chemical treatment shall not be made when there is a danger of wind drift of spray materials causing off right of way damage.
- Water borne, stem-foliage treatment shall stop at least 100 feet from all road crossings, stream crossings, residences, and agricultural areas and the selective basal application substituted.
- All brush over five feet in height, except small trees and shrubs, located within 100 feet of all roads shall be cut and stump treated.

Advantages

- Economical in dense brush.
- Moderate to good control in dense stands of brush.

Disadvantages

- Foliage "brown out."
- Limitations by terrain and access.
- Less selectivity in choosing stems to be treated.
- Less control over application of chemical solution.
- Limitations by weather conditions.
- Limited time period of application.
- Water supply may be a problem in some areas.

Application by helicopter

- Because of the complex nature of this job and the high degree of skill required in this operation, only qualified helicopter pilots with adequate experience in aerial right of way spraying shall be used.

- It is necessary that all brush on the right of way be treated from two directions parallel with the line in order to overcome the shielding effect of the brush foliage on the forward motion of the spray droplets thus causing lack of treatment from two directions, one-half the prescribed volume of solution will be applied to the right of way by the helicopter flying in one direction; and one-half the volume will be applied by the helicopter flying the same swath in the reverse direction.

Where the density of brush varies on the rights of way, an effort shall be made to vary the application with the brush density. Side dressing of the trees along the edge of the right of way is not permitted. Damage to trees and other plants off the right of way will not be tolerated.

- Each property owner on the right of way shall be contacted by the contractor's personnel to obtain consent for helicopter application.
- Treatment shall be from June 1 and shall be completed before August 15. Application shall not be made when winds exceed five miles per hour.
- Helicopter application shall stop at least 100 feet from all road crossings, stream crossings, residences, and agricultural areas and the selective basal application substituted.
- All brush over five feet in height, except small trees and shrubs, located within 100 feet of all roads shall be cut and stump treated.
- Selective cut areas shall be marked by the contractor so that they can be identified from the air and not treated.

Advantages

- Economical
- Effective kill on dense stands of tall brush.
- Access and terrain aren't a problem.

Disadvantages

- Foliage "Brown Out".
- Less control application of chemical solution.
- No selectivity of application.

4. Limitations by weather conditions.
5. Limited time period for application.
6. Disapproval by a larger portion of landowners than with other types of application.

With all the information on hand, a decision can be made so as to complement the conditions existing on the right of way with the proper chemical technique.

In some cases, several chemical techniques may be employed along a single right of way.

As an example, during the 1975 spray year, one 500 K V right of way was treated using different chemical techniques. A right of way survey was completed the previous year and presented a situation where a selective basal application and helicopter application could be properly used along different sections of the right of way

Approximately 270 acres were set up for the selective basal application because of the light to moderate density of brush intermixed with a variety of desirable vegetation. Access to and along the right of way was adequate for men and power driven equipment to accomplish their job with little difficulty. Finally, the areas surrounding the right of way were mainly crop lands and pasture areas. These existing conditions on the right of way dictated the selective basal approach.

Approximately 100 acres of the same right of way traversed remote, steep, mountain ridges and slopes supporting dominant, tall stands of black birch (*Betula lenta*) and black locust (*Robina pseudoacacia*). Access was limited with the population of the surrounding area being sparse. In this situation helicopter application was a very useful and economical tool to be used without the public disapproval that may have occurred in a more populated or agricultural area.

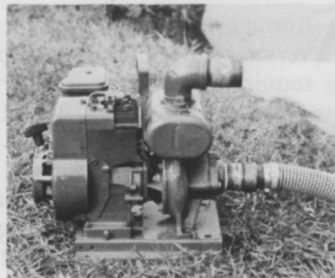
By using this approach to vegetation management on this particular right of way, as well as others, Penelec has achieved an effective control of tree species without the public disapproval that may result when we disregard all other factors and base an entire spray program on the economic aspect alone.

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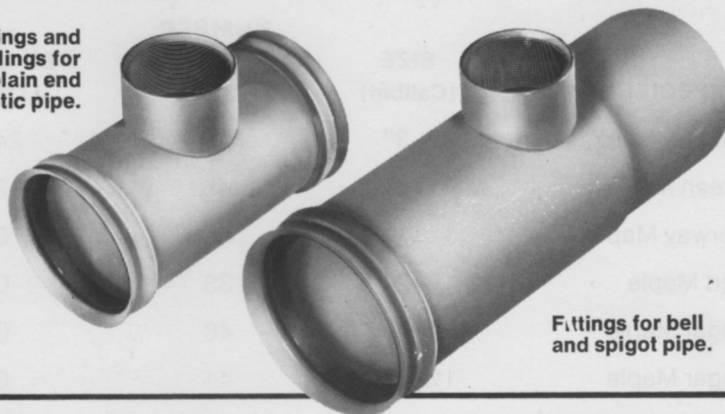
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Transplanting tolerances of seven tree species

by James G. Staley and Jamie Dickson

James G. Staley is a horticulturist at Memphis State University, where Jamie Dickson is a graduate assistant.

Although there is apparent universal knowledge of transplanting requirements for trees there are few reported articles on tree transplanting research.

Pelton (1966), Crockett (1972), and Baumgardt (1975) listed a detailed account of these requirements as pertaining to balled and burlaped trees.

As far as actual transplanting results, Ford and Foot (1973) reported a 93 percent survival rate of trees and shrubs using a tree spade. Tree sizes ranged from 2 - 7 1/2 inches in diameter. Cool (1975) found that trees transplanted with a tree spade rather than hand methods had less than 5 percent losses as opposed to 31 percent by hand digging.

Van de Werken and Beavers (1965) and Van de Werken and

Warmbrod (1969) showed that tree species, root system, and management practices determines survival and growth rate. In their studies, Sugar Maple, Pin Oak and Yellow Poplar were ranked from best transplanting to worst respectfully. Willow Oak was originally used but transplanted so poorly it was replaced with Pin Oak.

The purpose of this study was to expand knowledge of tree transplanting tolerances of various species of different sizes.

A total of 454 trees were received from nurseries in Tennessee and planted from November, 1975 to March, 1976 on the South Campus of Memphis State University. Ball sizes conformed to those recommended by the American Association of Nurserymen. The trees were planted in four replicated plots on 20 foot centers and pits were at least 15 inches larger than the balls. The pits were backfilled with a mixture of soil, peat and sand (3:1:1).

All trees were watered when set and watered thereafter as needed. The results reported here are based on records taken June 30, 1976.

In looking at the table it is noted that the Maples transplanted the best regardless of size, whereas the Willow Oaks transplanted the poorest regardless of size. Green Ash transplanted well but Bald Cypress did poorly.

The transplanting tolerances of the Sugar Maple and Willow Oak agrees with the results of the research work by Van de Werken (1965).

It is of further interest to note that the larger size of Willow and Pin Oaks transplanted better than the smaller trees. This may be the result of the larger trees having formed a more fibrous root system due to greater lateral root development. □

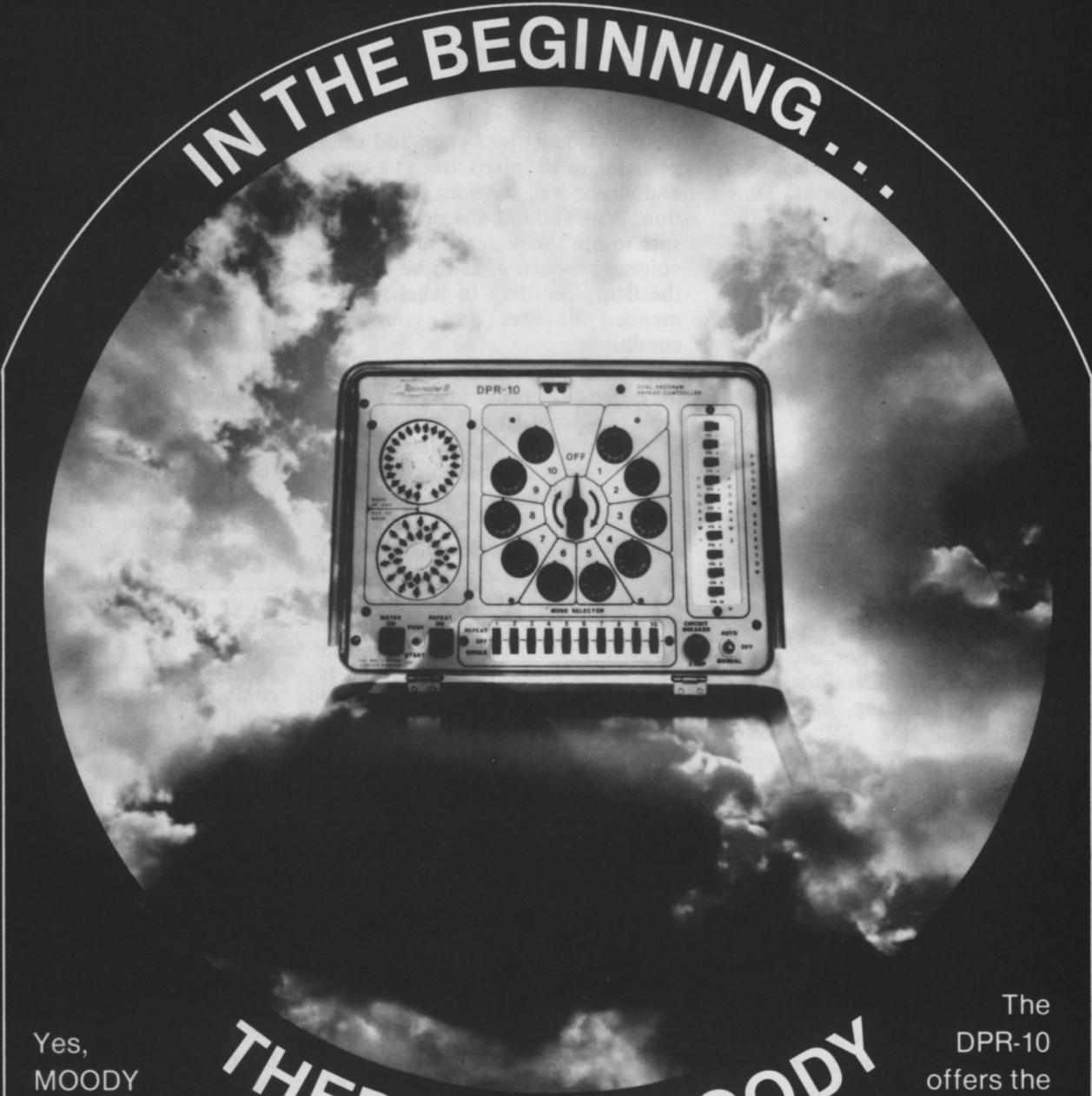
TABLE I

Transplanting Loss (Per Cent) of Seven Tree Species

SPECIES	SIZE (Caliber)	NUMBER OF TREES IN STUDY	PER CENT LOSS
Bald Cypress	2½-3"	29	24
Green Ash	1 - 1¼"	48	2
Norway Maple	1 - 1¼"	48	0
Red Maple	1½-2"	33	0
Sugar Maple	1 - 1¼"	40	0
Sugar Maple	1½-2"	41	0
Pin Oak	1 - 1¼"	23	9
Pin Oak	3 - 3½"	86	0
Willow Oak	1 - 1¼"	30	40
Willow Oak	3 - 3½"	76	26



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Tank mixing pesticides for effective results

Tank mixing pesticides is a practice that has gained widespread acceptance in recent seasons. Time and labor savings are two of the obvious benefits, but certain precautions must be taken when using this practice to insure proper control. A recent survey conducted by Stauffer Chemical Company points up some general guidelines to get the most out of this system and limit possible mistakes.

Read all labels

First and foremost to remember before attempting any tank mix is to read the labels. The information contained may be long and involved, but it is there for a purpose: to help you make the best use of the material. Follow directions carefully regarding mixing, method of application, dosage, soil characteristics and other applicable information.

Recent EPA guidelines permit the use of non-registered tank mixes until Oct. 1977 if dosages do not exceed label instructions for any product in the mix used singly for the same pests on the same crops, and if labels do not explicitly instruct against such a mixture.

According to Dr. Douglas Murphy, agronomist with Stauffer Chemical Co., "before you mix any pesticides, first do a test for material compatibility. Many pesticides may not form a stable mixture causing layering or formation of precipitates. Application of a mixture of non-compatible materials will cause excessive rates of each chemical in separate parts of the field.

Test compatibility

An easily performed compatibility test involves the following procedures:

First place one pint of the carrier, usually water or liquid fertil-

izer, in a quart jar. Then add each pesticide to be mixed, one at a time, and shake well between each addition. When adding the pesticides be sure to use the material in the same volume proportion as to be used in the field according to label recommended dosages and your soil conditions.

The usual order for pesticides to be added for proper mixing is: wettable powders first followed in order by flowables, water solubles, surfactants and emulsifiable concentrates. These are general recommendations and label information may give more specific directions.

After the materials are added and agitated thoroughly, let the jar stand for approximately one hour while inspecting for any separation by layer or precipitate formation. If there are any precipitates formed, or relatively quick separation into layers, the mixture is incompatible and should not be used.

Check agitation

"The amount of separation permitted depends somewhat on the agitation capabilities of the field spray tank. Generally, however, minor separating after 30 minutes is tolerable if field sprayer agitation is good," Dr. Murphy adds.

Compatibility tests should be performed each time you fill the spray tank even if using the same formulations. The same analysis of fertilizer may vary in mixing qualities from batch to batch and manufacturer to manufacturer, and untested mixes of the same material may cause problems.

Make sure you have good spray tank agitation. Even somewhat unstable mixtures may be possible if agitation is sufficient to keep them in suspension.

When mixing in the field sprayer, put the carrier in prior to

addition of pesticides and allow time for thorough mixing between each material addition. Shortcuts may save you a few minutes, but the penalties can be exacted in yield and dollars.

Apply the fully agitated mixture as soon as possible after formulation to prevent possible separation, precipitation or caking. Do not allow mixtures to stand overnight without constant agitation.

Consult label information carefully regarding temperature and humidity data which may apply before mixing or if application is delayed.

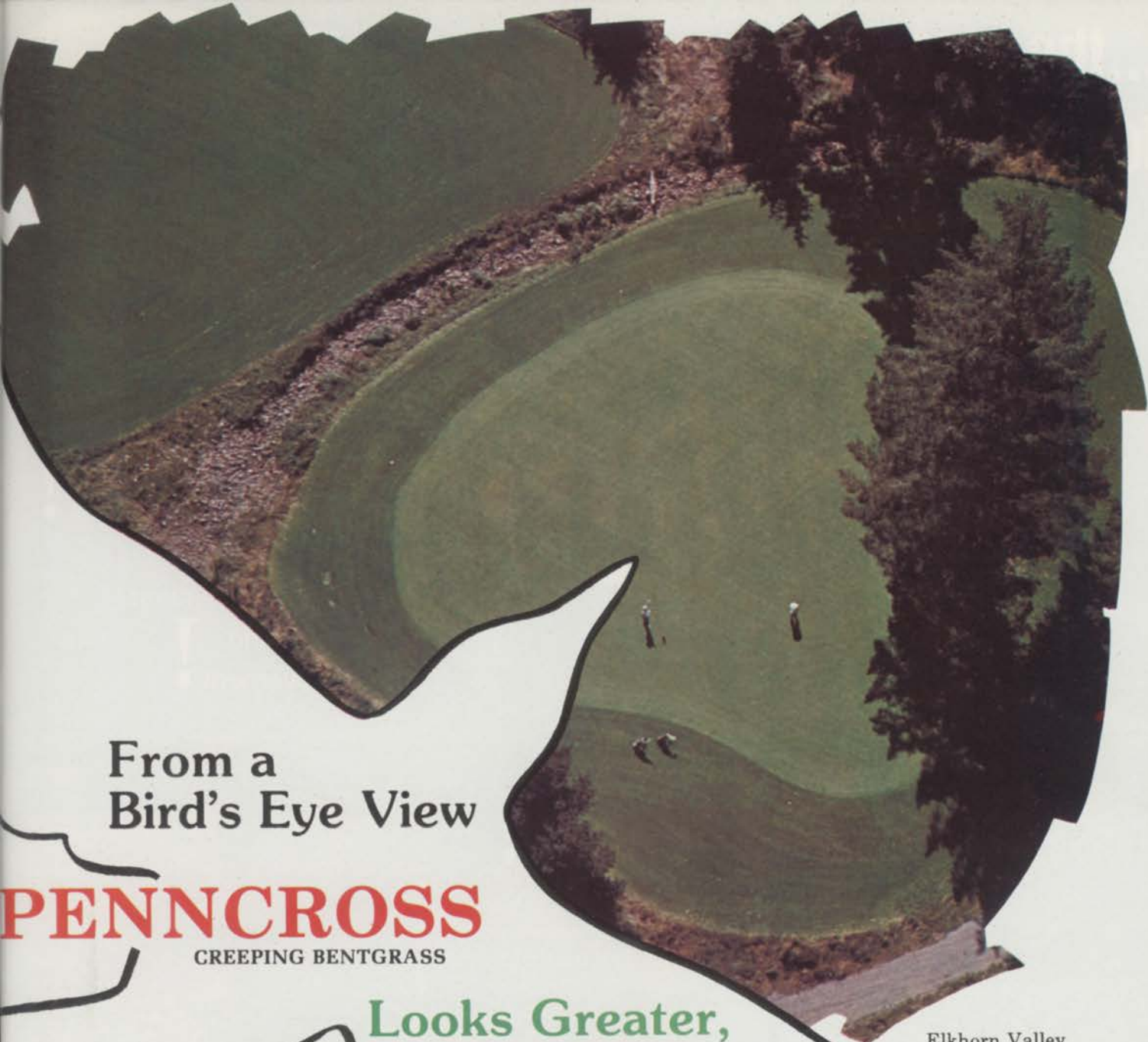
Test mix rates

If you are trying an unknown combination, test it out first on a small scale at varying rates and under different conditions before large scale use. Check with extension agents for information concerning university test data on new mixes or local water conditions which may affect mixtures.

Don't mix pesticides which require different application methods. "Using foliar insecticides like Imidan, for example, with soil incorporated herbicides like Sutan + or Eptam, will cause improper placement of one or both of the materials," Dr. Murphy explains.

Don't hesitate to seek help from your local chemicals dealer or manufacturers representative for advice if problems crop up. Many times they will have access to information you might not know exists.

Do not exceed or underrate dosages of registered tank mixes. Registration is granted only after exhaustive testing under all possible conditions to assure proper control. Varying these rates may result in crop injury or pesticide non-performance. □



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Lime applications for soil neutralization

By Dr. Roger C. Funk

Turfgrasses will not grow well in highly acid soils, and since many soils in the United States are acid by nature, well established lawns may require periodic applications of lime.

Acid conditions of soils can result from the leaching of calcium and magnesium (the alkaline constituents) from the root zone; yearly applications of nitrogenous fertilizers; the use of organic material as top dressing or as a soil conditioner; and the washing to sulphur from the air into the soil by rainfall.

Acid soils are commonly referred to as "sour," whereas alkaline soils are called "sweet." Soil reaction is measured by the concentration of hydrogen ions in the soil which is expressed by a unit (pH) between one and 14. A soil with a pH of seven is said to have a neutral reaction. Soils with a pH rating of less than seven are acid and those with a pH above seven are alkaline. The pH of most soils with an established turfgrass will vary between four and eight.

What is lime?

Lime is a compound of calcium or magnesium and is a term used quite loosely in the plant care industry. (Note: Calcium sulfate, [gypsum] is not a liming material.)

A chart of liming materials with their relative neutralizing values is given on the opposite page.

There are three major types of lime and each has its advantages and disadvantages.

(1) Ground agricultural limestone is also known as calcic limestone and is almost pure calcium carbonate (CaCO_3). Ninety-five percent of all lime used in the U.S. is

calcium carbonate because it is the most abundant and cheapest form. Also, it is not caustic and disagreeable to handle as is burnt or hydrated lime.

Ground agricultural limestone containing significant amounts of magnesium carbonate is called dolomitic limestone or dolemite. Most recommendations for additions of lime are for ground limestone or its equivalent.

(2) Burnt lime is also known as quick lime or caustic lime and is primarily calcium oxide (CaO). Gloves should be worn when handling either burnt or hydrated lime. Burnt lime has twice the neutralizing effect of calcium carbonate and should be used at $\frac{1}{2}$ the recommended rate.

(3) Hydrated or slaked lime is calcium hydroxide (CaOH_2) and is about $1\frac{1}{2}$ times more effective and quicker to react than ground limestone.

Effect of lime

Most cool-season turfgrasses respond best to a fertilization program when the soil pH is about 6.5. Soils with a pH significantly above or below 6.5 are not necessarily infertile, but nutrients may become unavailable by combining to form insoluble compounds which cannot be absorbed by grass roots. In addition, acid soils promote the solubility of heavy metals such as copper and zinc which may reach toxic levels and reduce plant growth.

Lime corrects an acid soil condition, thereby assuring maximum benefits from applied fertilizers and reduces the potential for heavy metal toxicity. Lime supplies calcium which is an essential macronutrient

Roger C. Funk Ph.D is director of research at the Davey Horticultural Institute.

Relative Neutralizing Values of Liming Materials

Liming Material	Chemical Formula	Relative Neutralizing Value, %
Magnesium oxide	MgO	250
Calcium oxide	CaO	178
Magnesium hydroxide	Mg(OH) ₂	172
Calcium hydroxide	Ca(OH) ₂	135
Magnesium carbonate	MgCO ₃	119
Calcium carbonate	CaCO ₃	100

for plant growth and development.

Calcium ions also help aggregate clay particles, improving air circulation and water drainage.

When and how to apply lime

Applications of lime on established lawns may be made at any time of the year. However, the most effective times are fall, winter and early spring — in that order. Alternate freezing and thawing and early spring showers help work the lime into the soil.

Lime must be spread evenly over the entire area because it does not move appreciably in a lateral direction. Lime should not be applied

when the soil is too wet since it may be difficult to obtain an even distribution and the turf may be disrupted. If heavy equipment is required to spread the lime, less damage is done to the soil and grass when the ground is frozen.*

How much to apply

The amount of lime required to raise the soil pH to 6.5 will vary with the degree of acidity, the soil type and the lime material. Light, sandy soils require less lime than soils high in silt or clay, but will require more frequent applications. In general, a pH test every three to five years is recommended.

Single applications of over 50 pounds of lime per 1,000 sq. ft. are not recommended. If over 50 pounds are required, divide the total amount in increments of 50 pounds and allow at least six months between applications. Heavy applications of lime can be just as damaging as lime deficiency. □

**Most lime is applied through a drop spreader to ensure uniform, controlled distribution and to minimize dust. However, a recently developed pelletized, or granular, lime allows the use of a cyclone spreader. Care should be taken around acid-loving plants to confine lime to lawn areas.*

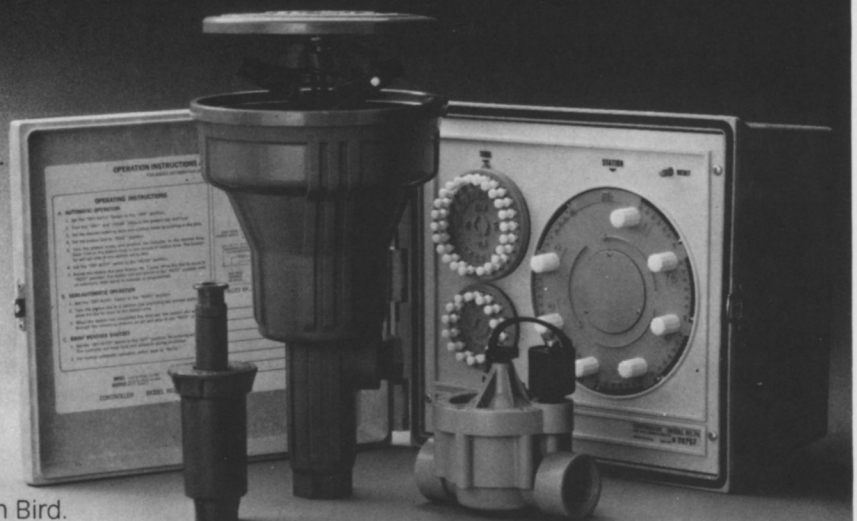
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- Extra large 1½ bushel nylon bag grass catcher available.

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- Rakes out thatch ■ Rakes cleaner with less effort. Powerful 5 hp engine.
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Lawn and garden equipment market to triple by 1985

The market for lawn and garden equipment, at \$3.6 billion in 1975, will climb to \$9.8 billion by 1985, forecasts a new study by market research specialists Frost & Sullivan, Inc. in New York City. The market for lawn and garden growing products and supplies, at \$1.8 billion in 1975, will reach \$3.8 billion by 1985, it adds.

The 211-page study analyzes specific product categories to forecast market growth as follows:

HARDLINES SALES

Categories	Percent Increase 1975-85
Power Lawn Mowers	154%
Other Big Power Tools	164%
Hand Power Tools	249%
Non-Power Garden Tools & Equipment	181%

GROWING PRODUCTS AND SUPPLIES SALES

Categories	Percent Increase 1975-85
Fertilizers	88%
Pesticides	59%
Soil Conditioners	82%
Grass Seed	N/A
Growing Products	156%

Within hardlines, chain saws are the fastest growing item, the study finds, with the market made up of gas-powered models that sell for \$150 and the faster-selling electric saws priced at \$50 at retail. Unit sales on chain saws will double by 1980 and will more than triple by 1985, the study forecasts.

"The handpower tool market is also booming, and it will continue to do so," the study adds. Another high growth area: non-powered garden tools and equipment. As for plants and other growth products, their sales will climb steadily over the next ten years, the study says.

On the other hand, fertilizers, soil conditioners, and pesticides are becoming mature markets.

The study entitled "The U.S.

Market for Lawn and Garden Equipment and Supplies" also reports on an important survey of retailers, wholesalers, and manufacturers; it identifies nine types of retail outlets. The more important include general merchandise stores that account for 26 percent of all lawn and garden sales; specialist outlets, including retail nurseries, that account for a 17 percent market share; and home centers and hardware stores that hold a 10 percent market share.

Florists hold a 35 percent market share, but cut flowers generate most of the revenues. In recent years, however, florists have moved heavily into potted plants and foliage, the study says, and thus this retail sector has become "an economic factor in the marketplace."

Here's how selected retail outlets will participate in the market growth:

● **Retail lawn and garden stores (including nurseries):** Their sales currently running at \$1 billion annually will climb to \$3.6 billion by 1985 to experience "the sharpest growth in lawn and garden merchandise sales." Lawn and garden stores have increased sales in recent years at a faster rate than have general merchandise stores, and this trend will also continue, the study concludes.

● **Hardware, lumber, and home center stores:** While lawn and garden product sales accounted for by hardware outlets have fallen significantly over the past 20 years, the sale of such merchandise through home centers has increased very rapidly in the last five to eight years. Furthermore, such sales growth by home centers that emphasize lawn and garden merchandise in the first place will continue to increase.

● **General merchandise stores:** These once accounted for the highest growth rate in lawn and garden supply sales, but now F&S forecasts "a somewhat lower rate of growth" in the future. However this type of store will continue to dominate the hardlines area. □

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For one or more years.*



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Granular, non-selective, non-crop herbicide

Why let weeds make a hazardous, unsightly takeover of your operation? And why waste time mowing, hoeing, pulling or griping? Oxy Ureabor puts weeds out of sight, out of mind, for one or more years. In most cases, at high rates, no weed or seedling is tolerant of Ureabor. And it's so easy to apply direct, from convenient-size bags.

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- Ready to apply straight from the bag.
- Water soluble—readily absorbed after rainfall or sprinkling.
- Quick action—down to the root zone.
- 98% active ingredients (1 to 3 lbs. per 100 sq. ft.)

*Product	Movement in Soil	Control		Comparative Longevity	Comparative Product Feature
		Annuals	Perennials		
Monobor-Chlorate	Low	Excellent	Good	Long	Most economical Excellent under asphalt paving.
Monobor-Chlorate + Diuron (Weed and Grass Killer)	Low	Excellent	Good	Longer	
Ureabor	High	Excellent	Excellent	Longest	Strong control of deep-rooted perennial weeds.
Borocil IV	High	Excellent	Excellent		Use where chlorates not desired.
Hibor C	High	Excellent	Excellent		Excellent for retreatment programs.

*Single high-rate application under normal soil & rainfall conditions. Always read and follow directions on labels.

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Address _____

City _____

State _____ Zip _____

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Houston, Tx. 77001
Attn: Herbicide Products Mgr.
Suite 606

WTT

How to make your board see the value of new turf equipment.



Convincing your Board of Directors that new turf equipment is a necessary and sound investment can be one of your most difficult tasks. They don't always see the benefits behind such a purchase.

And as good businessmen, they won't commit the money until they're sold on the expenditure. So when it comes time to face them, here are some of the things you should point out.

Point #1: The Duffer Demands More.

Today's golfer is more sophisticated than ever before. He has seen, and many times played, some of the finest courses in the world. He recognizes the value of a good course. And if yours is sub-par, he'll go elsewhere.

With this more sophisticated golfer comes the need for more sophisticated golf course maintenance. Heavy player traffic has increased the work required to keep the turf in top condition. So jobs that were once optional are now mandatory. Where spiking a green used to be sufficient, today it also needs deep aeration.

All this dictates the use of specialized equipment that wasn't available ten or even five years ago. Equipment that will enable you to build and maintain a top flight course, and help avoid special turf problems that could prove extremely costly.



Point #2: Machines Do More.

In the past decade, the price of labor has tripled. The same number of men must do more work in less time to give you the same value for each labor dollar invested. Mechanized equipment allows you to trim hundreds of unnecessary man-hours. One man can now cut more sod in an hour than six men used to cut in six hours. Or that same man can aerate 18 greens in a few hours instead of a few days.

New engineering concepts coupled with precision machinery means he'll do a consistently good job. You get better results and fewer occasions when a job must be redone.

And your turf equipment is depreciable; something your labor is not. You get an accounting break over a period of years. At the end, it's like owning a piece of free machinery. One that will continue to save you money long after you've paid for it.

Which brings us to the third point.

Point #3: Longevity Makes Them Worth More.

Equipment life should be a prime consideration when you select a manufacturer. The longer a machine works, the more it does,

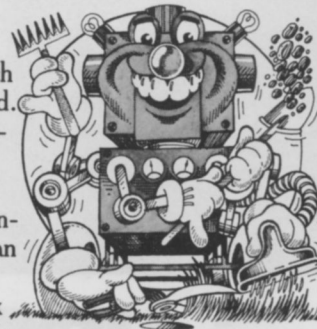
and the less maintenance it requires, the better your investment. And here's where we'd like to put in a little plug for Cushman and Ryan turf equipment.

Both lines of machinery are built to last . . . and last. It's not unusual to see a piece of Cushman or Ryan equipment still doing its daily chores after ten or fifteen years of use. We believe the idea of "planned obsolescence" should be obsolete.

But performance is just as important as longevity. A Cushman Turf-Truckster and its accessories give you the capabilities to transport, spray, spike, dump, aerate, and top dress . . . all from one power source.

Ryan offers a machine for almost every turf task. Equipment that does a better job, in less time, and with a minimum of maintenance. For over 30 years, all Ryan equipment has been built with three goals in mind: quality, performance, and innovation.

If "A Day With the Board" is in your future, we'd like the opportunity to tell you more about the full line of Cushman and Ryan Turf equipment. Write to us and we'll send you our catalogs, full of detailed product information. Information that may help you open a few eyes to the value of new turf equipment.



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PAR EX[®]
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The Professional's Choice

Every customer wants the very best fertilizers for their lawn. Why? Because today everyone is green conscious. With IBDU and PAR EX fertilizers, you can provide the most complete, balanced nutrition available for turf and ornamentals.

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Circle 121 on free information card

Sleeping giant on the verge of awakening

The chemical lawn care industry is a large, sleeping giant. The dramatic growth demonstrated by a few companies, while an index to the rapid growth of the entire market, reflects only minutely, the growth potential for an industry which must serve more acres in lawns than are in farmlands in the entire U.S.

Today less than 5 percent of some eight million acres in home lawns in the United States have been touched by lawn care businesses, now in a dramatic upward growth spiral and accounting for some \$668,325,900 in trade.

Formerly a service under the aegis of chemical, oil and tree service companies, or performed on a small scale by landscapers and one-truck operators, the specialty market in this area is now thriving.

While the post World War II

home building boom and the push into the suburbs turned many Americans into novice gardeners, and pushed home and garden supplies to a healthy \$4.5 billion in 1960, the desire for labor saving devices paved the way. First for the use of power tools at home, and later for the development of complete services for the home premises.

According to The Wall Street Journal, May, 1961, sales of power gardening equipment alone rose

Continued on page F



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Over twenty turf insects are listed on the Diazinon® label. More than any other major turf insecticide.

Granted, a turf manager must be able to recognize an insect problem. And know when to apply treatment for the most effective control.

But when you've got Diazinon, the one broad-spectrum turf insecticide with the label to prove it works for you, it sure makes things easier.

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Cutworms, Digger wasps, Earwigs, Frit flies, Lawn billbugs, Sod webworms (Lawn moth), Sowbugs, White grubs (such as Japanese beetle larvae), Brown dog ticks, Bermuda mites, Chiggers, Fleas, Leafhoppers, Millipedes, Rhodes-grass scales.

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Or write us.

Agricultural Division, CIBA-GEIGY Corporation, P.O. Box 11422, Greensboro, NC 27409

Diazinon

Sleeping giant

Continued from page C

from \$75 million in 1950, to some \$400 million a decade later.

The transplanted frontiersman, now a suburbanite, was determined then as now to do it himself even if he had to spend with a free hand to get the job done.

In search seemingly of a panacea for blighted or less than luxuriant front lawns, Americans coughed up approximately \$500 million in 1960 for fertilizers, insecticides and weed killers. Home and Garden Supply Merchandiser, a trade publication, reported.

A 1976 statistic from U.S. Home and Garden Supply Merchandiser shows that nine billion dollars were spent by Americans on home and garden supplies, an indication that a significant number of homeowners, perhaps, are still do-it-yourselfers.

Precisely when it became clear that there was a living to be made in approaching the homeowner, chemicals in hand, and offering to refurbish a damaged lawn, or when it became apparent that a frustrated homeowner might relinquish control of his well-won half acre, it is difficult to say.

Landscapers who had long tended and pruned ornamental plants and shrubs for those who could afford it, and groomed lawns for many, were the logical heirs to the great volume of business in chemical application. It was right at their fingertips.

But most landscapers were not convinced that the dollar potential was sufficient to justify the costs they would incur in acquiring of new machinery and supplies. Many were reluctant to change practices developed through generations of experience.

Oil companies, who had the built-in capability of performing basic fertilization and weed control in a spraying application, were perhaps the first to try the lawn care market with modest success.

Tree service companies, whose techniques and equipment were also well-adapted to the emerging chemical lawn care market, were

perhaps the antecessors of the traveling liquid-application service as we know it today.

These were the pioneers within the industry. Their efforts in lawn care as a specialty, or as an exclusive function, are documented as early as 1915. However, it was not until the mid-fifties that the technological know-how was blue-printed, with the assumption that chemical lawn care services could be rendered to homeowners, at a cost which would be lower than a trip to the garden center and some diligent man-hours.

But it was not mastered, and the modern lawn care service did not evolve until the early 1960s.

Strangely, the visionaries were not the people who were working within the industry. Rather, they were market-wise businessmen who saw the growth potential of a concept, invested the requisite capital to develop necessary machinery, and projected the dollars and cents they might realize. And they were right.

The most prolific dreamer was a kid from Brooklyn who thought that somehow he could apply the principles of farm technology to lawn care, thereby dramatically cutting labor costs and rendering efficient service to the homeowner.

After some experimenting in the mid-fifties, Daniel Dorfman, who describes himself as a "tinkerer," perfected the design for a machine capable of simultaneously rolling, fertilizing, aerating and seeding a lawn in one pass with an unskilled operator at the controls.

The result was Lawn-A-Mat, incorporated in 1961 as the first automated lawn care service company and the prototype for many of the services that cropped up in high densities in Long Island, more generally in the Boston-Washington corridor, and elsewhere in the following ten years.

Dorfman began selling Lawn-A-Mat franchises in 1962 and found enough takers to handle some 300 franchises by 1967, with an average volume per dealer of approximately \$75,000, in a broad range from \$20,000 to \$400,000 per annum, covering a geographic spread encompassing New York to Hawaii to the west, and Canada to Florida to the south.

According to the Washington

Strangely, the visionaries were not the people who were working in the industry. They were market-wise businessmen . . .

Post, August 13, 1969, Stanley J. Gordon Jr., who signed on as a Lawn-A-Mat franchisee in 1965, reported a gross income of \$310,000 for the first six months of 1969 as Lawn-A-Mat of Metropolitan Washington, Inc.

Success stories abound. Anthony Giordano, briefly a Lawn-A-Mat dealer in 1963, set out to build his own business. He founded Lawn Doctor, in Wickatunck, N. J., and began franchising in 1967. Today Lawn Doctor outfits are located in some 23 states, the dealers numbering 110, with an estimated total volume of approximately \$6 million. Giordano projects that Lawn Doctor will take in \$8 million in 1977.

Franchise operations are not necessarily doing all the business in lawn care. Chem-Lawn, the thoroughbred of the industry, began a slow, measured-growth endeavor in lawn care in 1969. On a company-owned basis, Chem-Lawn opened dealer offices and looked to a personalized, on-call service program to build business.

Headquartered in Atlanta, Chem-Lawn now maintains 70 dealers throughout the U.S., representing a volume of approximately \$36 million.

For 1977, they are projecting a volume of \$52 million.

According to The New York Times, Sunday, April 11, 1976, few complaints have been registered about lawn services with the Suffolk and Nassau County Departments of Consumer Affairs, both located on Long Island, an area where business for consumer lawns is highly competitive and reportedly the biggest market in the country for mechanized lawn services.

If anything troubles consumers about the new wave of lawn care services, it is probably not the costs. Pricing frequently is assessed according to the number of square feet serviced, the number of visits of the serviceman, and the overall health of the lawn when the customer initiates the service. While there have been some allegations that square footage has been overassessed, with a resultant increase in costs to the consumer, variables in pricing are generally explained to the customer and there are few surprises.

According to Money Magazine,

March, 1976, season-long care, on a typical 5000 sq.-ft. lawn costs the customer between \$150 and \$200 dollars a year for a service that generally included four applications of fertilizer, two treatments with an aerator, reseeding at least twice, plus pesticide, weed killer, fungicide, crabgrass control and lime as needed. The charges were based on a nominal per-square foot charge of three or four cents.

While many companies offer an annual contract which outlines the services they will perform for the customer at a per annum rate, some companies service accounts on an "as needed" basis. Others price on a per application basis.

Chem-Lawn, generally regarded as the cheapest service available to the homeowner, charges customers on a per application basis, the average cost to a customer coming to approximately \$130 in a year, accounting for variance in the size of the lawn, and the amount of service required to keep it healthy.

Lawn Doctor offers tailored programs providing for five to nine visits annually to a home lawn. The service is contracted annually and costs a customer approximately \$165 to maintain a lawn of 10,000 sq. ft.

Lawn King, a franchise operation headquartered in Fairfield, N. J., offers a firm annual contract to the customer providing for eight visits at an approximate cost of \$220 per account.

The only limiting factor in the future of the lawn care industry could be its lack of organization, a consequence perhaps of rapid, almost overnight growth and insufficient monitoring of the dimensions of that growth. □

Franchise operations are not necessarily doing all the business in lawn care.

A comprehensive look at a mushrooming billion dollar business

Weeds, Trees & Turf surveyed the newly emerging chemical lawn care field using a variety of techniques, including personal interviews, a direct-mail questionnaire, telephone interviews, and research of existing documents and printed materials. The following materials are offered as a sincere and comprehensive effort to portray the scope and character of an industry which is new, unique and growing rapidly.

Lawn service companies traded an average of \$141,545 last year and are projecting a healthy growth rate of almost 25 percent in 1977.

Although a number of companies have gone exclusively into
Continued on page L

Customers, Marketing, Services

The homeowner is not the exclusive user of lawn care services. About 85 percent of the lawn care companies responding indicated they also serviced turf areas surrounding office buildings, condominiums and apartments, industrial plants, hotels and motels, cemeteries, churches, and other miscellaneous establishments.

Approximately 56 percent of those respondents who said they were handling other turf areas identified commercial uses (banks, businesses, office buildings) as accounts.

Lawn care businesses buy their fertilizers and chemicals from both dealer/distributors and manufacturers. Although some 41.3 percent of those surveyed indicated they bought supplies from dealers, and only 21.4 percent identified manufacturers as a primary source of these materials, 37.3 percent of the sample indicated they purchased from both sources.

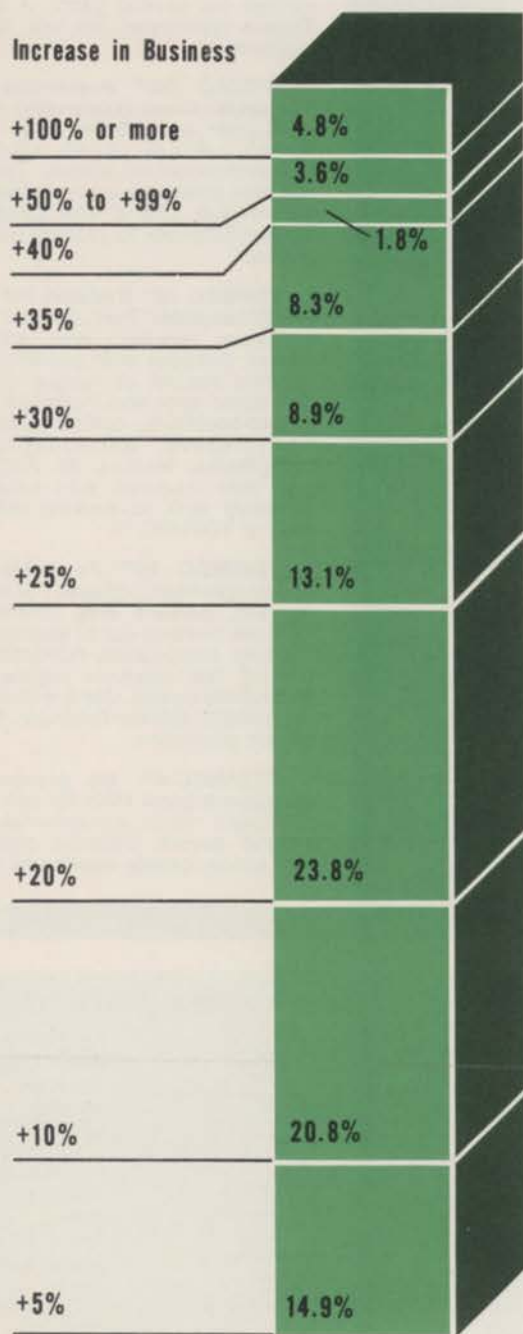
Among the some 75 percent of respondents who advertise their services to the homeowner, 76.9 percent indicated they buy space in newspapers. Some 39 percent said they use direct mailings to the consumer. Almost 30 percent said they use door to door representatives to sell their services, and 20.9 percent buy radio time.

Most of the lawn care services are using dry applications of fertilizer and many are using a combination of liquid and dry fertilization. Only a small percentage of those companies interviewed said they were using ex-

clusively liquid fertilizer applications. When asked to enumerate the services they offered to the consumer, those polled generated the following results.

Services Available	Percent
Fertilization	100.0
Liquid	6.4
Dry	57.7
Both	35.9
Pre-emergence crabgrass and foxtail control	78.8
Weed control	86.2
Chinch bug control	67.0
Fungus control	65.5
Sod webworm control	68.9
Grub proofing	55.2
Bill bug control	31.5
Aphid control	43.4
Soil testing	48.3
Liming	58.6
Soil conditioning — calcium and magnesium carbonate	40.9
Tree feeding	51.2
Spikes	23.6
Tablets	6.9
Dry fertilizer	41.9

WHAT IS YOUR ANTICIPATED INCREASE IN BUSINESS IN 1976 OVER 1975?



Chemical Purchases

When asked to rank percentages of chemical purchases by type, respondents generated the following data:

Percentage Of Chemical Purchases	Percent Responding
Fertilizer	
Less than 10 percent	1.2
10 - 24	9.5
25 - 49	16.0
50 - 74	46.0
75 - 99	23.7
100 percent	3.6
Herbicides	
Less than 10 percent	14.4
10 - 24	56.9
25 - 49	20.3
50 - 74	7.2
75 - 99	—
100 percent	1.2
Insecticides	
Less than 10 percent	19.1
10 - 24	56.1
25 - 49	13.4
50 - 74	6.4
75 - 99	3.2
100 percent	1.8
Fungicides	
Less than 10 percent	47.2
10 - 24	44.8
25 - 49	4.8
50 - 74	1.6
75 - 99	—
100 percent	1.6
Other	
Less than 10 percent	44.4
10 - 24	28.9
25 - 49	20.0
50 - 74	—
75 - 99	—
100 percent	6.7



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TRIMEC Broadleaf Herbicide. Although it is the most efficient and effective product of its kind, Trimec actually costs less in use than any other. Its synergistic action controls the widest range of broadleaf weeds with one application. Root absorption is minimal, thus Trimec is trouble-free for flowers, ornamentals, trees and shrubs — both deciduous and coniferous. No vapor action after application. Effective in temperatures of 50° or lower. Sequestered to overcome water hardness problems. Treated areas may be seeded within two weeks. Non-flammable and non-corrosive in use. Biodegradable; friendly to the environment. Stable in storage for several years. A special Trimec Bentgrass formula is also available.

DYMEC 50™ Preventive Turf Fungicide. Gives outstanding control of Copper Spot, Dollar Spot, Brown Patch, Stem Rust and the Helminthosporium strains. The 50% wettable powder is green for less visible residue. Use it with Exhalt®800 Sticker-Extender to prolong its effectiveness.

TOPMEC 70™ Systemic Fungicide for Ornamental Turf. Gordon's 70% wettable powder, with spreader-sticker, provides both preventive and curative control of fungus diseases like dollar spot and Fusarium blight. Broad-spectrum control. Ideal for bentgrasses, bermudagrasses, bluegrasses, fescues, St. Augustine, and their mixtures. Add exhalt 800 to spray tank to prolong effectiveness of TOPMEC 70.

FORMEC 80™ Fungicide is a broad-spectrum disease preventive for turf, flowers and ornamentals. With the phasing out of cadmium and mercury compounds, FORMEC 80 is one of few products registered to control red thread. Use it with Gordon Exhalt®800 Sticker-Extender for extended protection.

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• Custom Chemicals, Inc.

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• Turf Supply

broadleaf weeds before they emerge. Not phytotoxic for established turf grasses. Apply in fall or early spring for spring and summer control.

AMINE 2,4-D Turf Herbicide, the old reliable dandelion killer. Although Trimec® is by far the most efficient broadleaf herbicide, Gordon AMINE 2,4-D Herbicide is sometimes indicated for general weed control on roughs, roadsides, outbuildings, etc. A simplified label specifically for turf application.

VEGEMEC™ Vegetation Killer. Destroys existing vegetation and prevents unwanted new growth. Ideal for parking lots, fence lines, outbuildings, near fire hydrants, on cracked blacktop and concrete. Gives all-season control. Promptly visible (self-marking) on foliage. Non-volatile.

CARBAMEC™ Liquid Sevin™ Spray provides excellent protection against a broad spectrum of certain insect pests on turf, shade trees, flowers and ornamentals. Easy to use. Offers complete dispersion and uniform distribution. Flowable formulation won't settle hard in container.

Exhalt®800 Sticker-Extender. Helps insecticides and fungicides cling to trees, shrubs and turf. Encapsulation protects them against erosion from wind and water to prolong their effectiveness. Dries in an hour or less. Fewer sprays needed, thus it reduces labor and material costs.

Exhalt®4-10 Anti-Transpirant for plants and turf. Reduces water loss, extends transplanting season, reduces transplanting shock, protects plants from salt spray. Especially helpful in winter and during summer droughts. Reduces water loss on cut plants. No agitation. Water clean-up.

AQUA-ZORB™ Organic Wetting Agent and Soil Penetrant conditions hard, adobe-type and clay soils. Reduces runoff, erosion, and puddling. Makes soils more receptive to fertilizers and herbicides. Helps balled nursery stock live. Improves irrigation efficiency. Speeds septic drainage. Non-toxic to most vegetation.

From the TRIMEC® people —

GOOD NEWS

Your TRIMEC® distributor has your turf management needs all under one roof

As a turfman, you need a silent partner in the business. Someone you can count on for help. All kinds of help.

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You know he stocks TRIMEC, the world's most efficient, most economical broadleaf herbicide. But you may be less familiar with his other fine turf products — a complete family of up-to-date problem solvers:

A full range of *pre-emergent* and *post-emergent* controls for broad leaf and grassy weeds. *Preventive* and *curative* disease controls. A broad spectrum insecticide. A sticker-extender for greater pesticide efficiency. A soil-conditioner and wetting agent

for special problems. All having the same great efficiency and economy you get with TRIMEC. And all supported by the professionalism of your Trimec distributor.

Call on him anytime . . . especially when you have stubborn problems. Draw on his specialized training, skills and experience. Let him help you plan a total, effective turf-management program. Remember, your Trimec distributor has a direct line to the Gordon Technical Service department. Between us, we can solve any problem you may have.

Whatever your specialty or particular concern, he has the technical data and the products you need. A complete turf-care center under one roof.

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Charlotte • E. J. Smith & Sons
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OHIO
Canton • Letherman Seed Co.
Cincinnati
• Century Toro Dist. Inc.
• Thornton Wilson
Cleveland
• U. S. Garden Sales, Inc.
Columbus
• Century Toro Dist. Inc.
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Dayton
• Century Toro Dist. Inc.

Elyria
• Lakeshore Equipment & Supply Co.
Foley • Desco Chemical Division
Marietta • Alto, Inc.
Toledo • Century Toro Dist. Inc.

OKLAHOMA
McAlester • Tony's Chemical House
Oklahoma City • Estes Chemicals, Inc.
Tulsa • All Best, Inc.
• Thompson-Hayward Chemical Co.
• Weir Sales Company

OREGON
Portland
• The Chas. H. Lilly Co.
• Van Waters & Rogers
• Wilbur Ellis Co.

PENNSYLVANIA
Hanover
• Miller Chemical & Fertilizer Corp.
Horsham • Pocono Supply Co.
Malvern
• Fisher & Sons, Inc.
Philadelphia
• Farm and Golf Course Supply Co., Inc.
Pittsburg • E. H. Griffith, Inc.
• Krigger & Company

RHODE ISLAND
East Providence • Old Fox Chemical, Inc.

SOUTH CAROLINA
Columbia • Regal Chemical Co.
Myrtle Beach • Bingham Seed Co.

SOUTH DAKOTA
Sioux Falls • C & R Supply Co.

TENNESSEE
Knoxville • Regal Chemical Co.
McMinnville • Forrest Nursery
Memphis
• Oldham Chemicals Company, Inc.
• Bob Ladd Co.
Nashville • Teco Tennessee

TEXAS
Dallas
• Chemical & Turf Specialty Co.
• Van Waters & Rogers
El Paso
• El Paso Turf Supply
Houston
• Swift Agriculture Chemicals Corp.

Lubbock
• Williamson Seed Co., Inc.
Paris • Estes Chemicals, Inc.
San Antonio
• Aggie Chemical Industries
Waco • Estes Chemicals, Inc.
Wichita Falls
• Estes Chemicals, Inc.

UTAH
Drem • Wasatch Chemical Div.
Salt Lake City
• Steve Regan Company
• Wasatch Chemical Div.

VIRGINIA
Chesapeake • Turf & Garden
Harrisonburg • Webel Seed Co.
Richmond
• Richmond Power Equipment
Roanoke
• Agri-Turf Products, Inc.
• Miller Chemical & Fertilizer

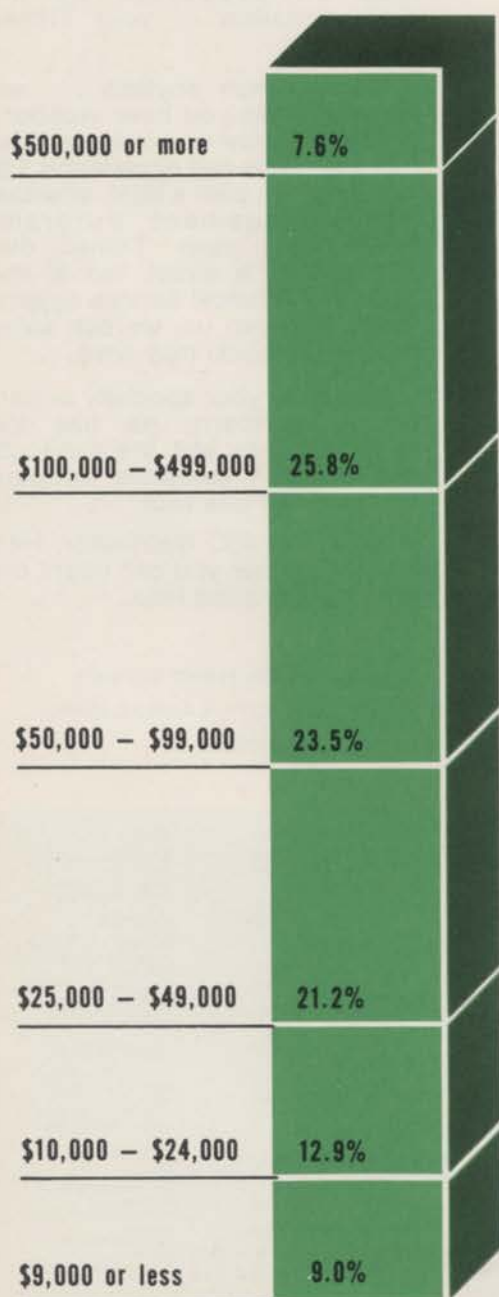
WASHINGTON
Kent • Van Waters & Rogers
Renton • Pacific Agro Co.
Seattle
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WISCONSIN
Chilton
• Horst Distributing Co.
Elm Grove
• Reinder Bros. Turf Equipment
Milwaukee
• Loft-Kellog Seed, Inc.
Sun Prairie
• Turf Management Supply

mushrooming business

Continued from page H

DOLLAR VOLUME OF BUSINESS?



the chemical lawn care business, the majority of operations are offering such services as a related function of another business. Of those surveyed, some 85 percent indicated they performed work other than chemical lawn care.

The industry is a relatively new one. While some 11.3 percent of the respondents indicated that they were founded prior to 1948, 29.6 percent of the companies surveyed went into business between the years of 1960-1969.

Franchise operations, heavily represented in the East, are not so prominent nationally. Only 7.2 percent of those surveyed were franchise affiliated.

Most chemical lawn care businesses are independents. Some 84 percent of the respondents indicated that they had no formal or fiscal ties to other entities. Slightly more than 5 percent polled were company owned.

When queried about the number of business locations they maintained, the majority of those interviewed said that they operated out of one shop, repre-

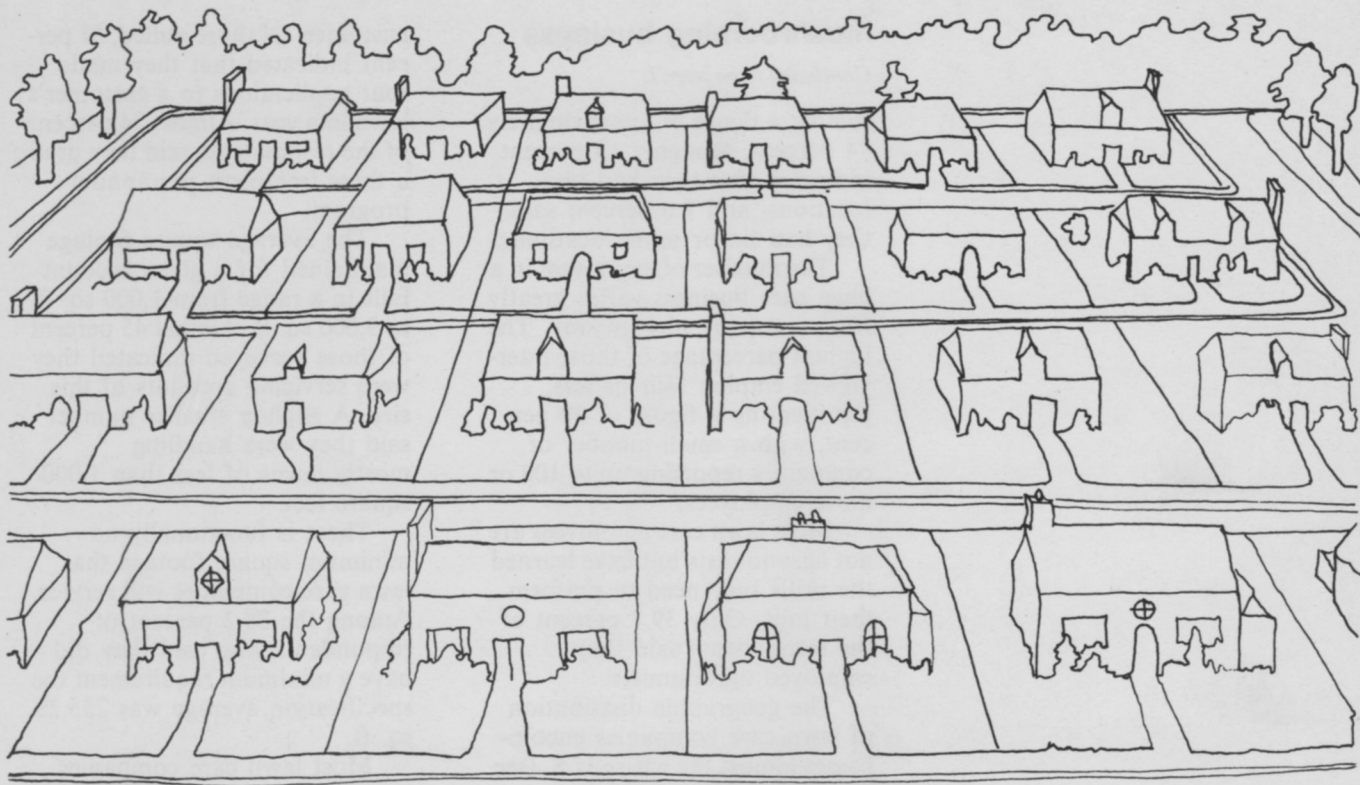
Continued on page N

Buying Months

Buying months for chemical and fertilizer supplies were portrayed by respondents in the following percentage increments

What months do you buy from fertilizer/chemical suppliers?

Month	Percent
January	20.4
February	41.9
March	57.0
April	47.3
May	45.7
June	40.9
July	29.0
August	34.4
September	26.4
October	12.9
November	6.4
December	6.4



Your lawn service can really grow with Nitroform®.

If you run a lawn service, you can expect to grow faster than grass after a May shower. As cost for seed, fertilizer, chemicals and equipment continue to go up, home owners are looking for a way out. They learn quickly that a lawn care service can do the job for less with guaranteed results. This means increased demand for your services.


As you grow, you need the most efficient technology. That's where Nitroform® slow-

release nitrogen can help. It fits the economics. It's also the best way to apply long-lasting nitrogen... whether your equipment is for liquid or dry application. Nitroform is available as granular Blue Chip® or as Powder Blue™ sprayable slow-release nitrogen. Nitroform gives uniform coverage, and it's compatible with most other lawn care materials, including pesticides.

Nitroform is the quality slow-release nitrogen. It keeps feeding long after your crew has moved on to other jobs. It's nonleaching... nonburning. Even inexperienced labor can apply it.

Predictable performance... easy application... dependable results. That's Nitroform. For more information, write Nitroform Sales, Organics Department, Hercules Incorporated, Wilmington, Delaware 19899.



 **HERCULES INCORPORATED**

STH77-5

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M

mushrooming business

Continued from page L

senting a figure of approximately 74 percent. Roughly 13 percent indicated that they had two locations, and 7.6 percent said they had six or more locations.

The number of employees in a lawn care business varies greatly from company to company. The highest percentage of those interviewed employ four or less, representing a figure of 39 percent, with a small number of companies reporting up to 100 or more employees.

Most lawn care employees are not agronomists but have learned the skills they need to perform their jobs. Only 39.7 percent of the respondents said they employed agronomists.

The geographic distribution of lawn care companies encompasses almost the entire U.S. (see center map) with the highest density areas occurring in New York and New Jersey. A substantial segment of the industry appeared in Florida.

Lawn care treatment programs usually offer three or four applications annually per

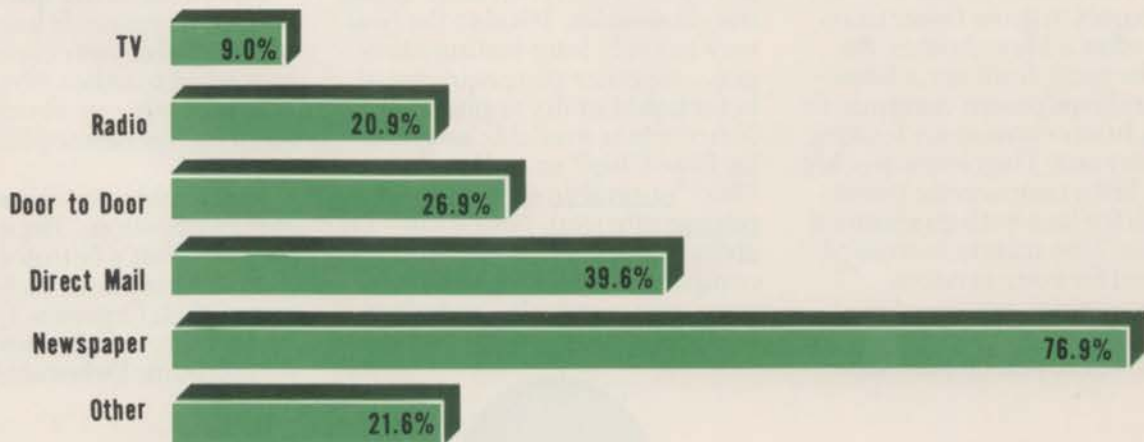
customer. Of those polled, 51 percent indicated that they made four applications to a customer's lawn in a year. Almost 24 percent of the respondents said they used a three treatment per annum program.

The average square footage maintained for a given account falls in a range from 1,000 sq. ft. to 9,000 sq. ft. Almost 45 percent of those surveyed indicated they were servicing accounts of this size. A slightly smaller number said they were handling mostly lawns of less than 1,000 square feet.

There is functionally no minimum square footage that lawn care companies will service. Among the 28.2 percent of respondents who said they did have a minimum requirement the specification average was 235.29 sq. ft.

Most lawn care companies keep their customers. While only 19 percent of the companies surveyed claimed 100 percent retention of customers from 1975-76, the average attrition rate of customers was only 18 percent, from an average number of accounts per company of 534. □

HOW DO YOU ADVERTISE?



Turf Kleen is more effective than 2,4-D or MCPP because it's 2,4-D and MCPP.



Chipco Turf Kleen is a combination of 2,4-D and MCPP. So it provides a wider spectrum of weed control than either one of them could when used alone. In fact, Turf Kleen is effective on both surface-creeping and broadleaf weeds. And that includes the weeds that downgrade and weaken turf. Like Buckhorn and other plantains, Curly Dock, Dandelion, Common Chickweed and many more.

Want to do a job on everything that 2,4-D and MCPP controlled without any extra work? Do it with Chipco Turf Kleen.



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**Lawn Care
Marketing**

Many kinds of companies, many kinds of services

*by Robert W. Miller PhD.,
vice president, ChemLawn Corp.*

Lawn service companies as they now exist are relatively new and are just beginning to find their place in the turfgrass industry. Although lawn care companies in some form may have existed for many years, it is safe to say that they did not become prominent until pesticides became a major factor in agriculture. Early lawn services were largely an extension of other horticultural activities and it has only been in the last ten years that lawn care companies have operated on a regional or national scale.

There are several types of lawn care companies now in operation. Perhaps the most numerous type is the mowing and grooming service which may be operated either by students and others on a part-time basis, or by full-time commercial companies that may offer other services in addition to mowing. Mowing services are mostly local and small; however the total expenditure for this type of service is undoubtedly large.

In some areas of the country, lawn service companies specialize in pest control. Many times these operations are a part of structural pest control services or other related businesses. These services are prominent in Florida and other locations where chinch bugs or other insects are especially troublesome.

Several regional and national companies sell franchises to operate a lawn service business in one location. The parent company usually helps in establishing accounting and operating procedures and may sell chemicals to the franchise. However, a recent court decision ruled that a franchise had the right to purchase materials on the

open market and is not obligated to purchase from the parent company.

Franchise operators offer a wide range of services. Most of them apply fertilizers and various pesticides. Some of them overseed, spike, aerate, and do other operations. Many times, special equipment that does several operations at one time is included in the franchise cost. In most instances, an individual franchise remains small because of boundary restrictions that are a part of the franchise agreement.

Another type of lawn care service is operated by the owner on a local level. This type of company may be small to medium in size, and may service from a few hundred to ten thousand or more customers. These companies offer a wide range of services depending on the individual operation. Mowing, landscape maintenance, and other services may be included in a base price or may be offered as optional services at additional cost. Local lawn service companies operate in many different ways and it is impossible to place them into a common category.

In the last ten years, some lawn care companies have begun to operate in several cities on a regional or national level. Each branch is company-owned and is operated by company employees. Some of these companies utilize part-time employees, others do not.

The type of service offered by the regional or national companies varies almost as much as service options of local firms. Most of them, however, apply fertilizer, herbicides, and insecticides according to the needs of local conditions. A few companies apply fungicides on a programmed basis but most do not unless there are unusual disease problems.

Some companies offer the complete package at an annual cost. Others charge separately for each component of the program.

The amount and kind of fertilizer and other chemicals used differ among companies. Some use both soluble and insoluble nitrogen sources, while others use only soluble materials.

Phosphorus and potassium may or may not be included in all applications. Lime, where needed, is applied by some companies; others either ignore it or use one of the so-called "liquid lime substitutes." Some companies include "soil conditioners" in their programs. These may be anything from potassium carbonate to any one of several liquid materials on the market.

Lawn service companies may either require an annual contract with or without prepayment or they may operate without contracts and charge only after applications are made. Cost of services vary several hundred percent among companies. Cost for chemical applications to an 8,000 sq. ft. lawn vary from as little as \$85 to as much as \$300 for 4 to 6 scheduled annual treatments. Some lawn care companies make service calls and apply supplementary applications at no additional cost to their customers, others offer limited service without additional charges, and some charge for all service calls.

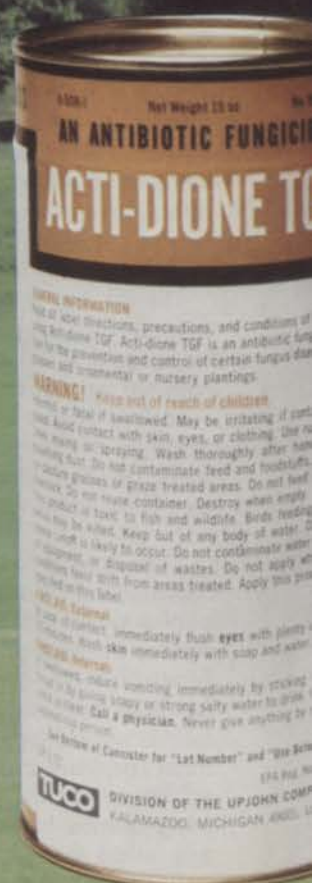
The most important item that any lawn care company has to sell is service. Homeowners are not particularly interested in what products are applied to their lawns. They are interested in a nice-appearing lawn, free from weeds and other problems. They expect the company to quickly respond to service calls and they expect prompt corrective action if they have problems. Many of their questions are related to

Continued on page T

The most important item that any lawn care company has to sell is service.

The

Standard.



WARNING!
HARMFUL OR FATAL IF SWALLOWED. KEEP OUT OF REACH OF CHILDREN.
See other warnings on back panel.

TUCO DIVISION OF THE UPJOHN COMPANY
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Established by years of consistent performance.



Stop turf-damaging insects with the proven insecticide—**PROXOL® 80 SP.**

When you're responsible for turf playability season in and season out, you want management techniques and turf health products you can rely on. You want consistent performance. And that's why you should rely on Acti-dione® turf fungicides. They're a standard in the business. They have been for more than 20 years. And today there's still no evidence of fungus resistance.

In the spring, start your four-season spray program early before leafspot, dollarspot, or melting-out get started. Use Acti-dione TGF® or Acti-dione RZ®, alone or in combination. Both products are easy to use, economical, and attack fungi without killing bacteria that are helpful to grass.

As the weather turns warmer in the late spring, continue spraying tees, greens and fairways with Acti-dione TGF. Where brown patch is a problem, use Acti-dione® Thiram. Both products control the major hot weather diseases like dollarspot, melting-out, fading-out, leafspot, rust and powdery mildew.

You know how your tees, greens, and fairways look is a reflection of the care you give them. So give them the very best. Use Acti-dione turf fungicides. They're the standard.

TUCO

Division of The Upjohn Company

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The industry is unorganized . . . and there is no standard of quality

many services

Continued from page Q

trees, shrubs and other landscape plantings. Customers want qualified people with professional equipment to make applications and they expect the treatment to be made with care — care for both the lawn and for surrounding plants and properties. Service is the name of the business.

Two points are obvious from the previous discussion. First, the lawn service industry is unorganized and there is little chance that it will be organized in the near future. Secondly, there is no standard of quality for the industry and it is unlikely that stan-

dards could be agreed on and even less possibility that they could be put into effect. State and federal requirements for pesticide operators' license and label restrictions for the use of pesticides have made it more difficult for marginal operations, and some states require that the invoice must state the amount of fertilizer applied to a lawn. Other than these, the only standards are those set by leaders in the industry. An individual selecting a lawn care company should have a clear understanding of the services offered by the company, the materials that will be applied to the lawn, and the reputation of the company in question. □

Gas shortage cuts fertilizer output

From the New York Times

WASHINGTON FEB. 5 — Natural gas shortages have curtailed production of nitrogen fertilizers needed for spring planting in some of the country's principal growing areas, according to industry data and random checks with factory executives.

In addition, the executives say, transportation problems threaten delivery tieups.

The curtailments, including plant shutdowns in some areas and reduced operations in others, pose a new threat to food production and consumer prices in the wake of water shortages reported in the West and Middle West.

"I'm not going to be panic purveyor and push prices up, but we're apprehensive," Edwin M. Wheeler, president of the Fertilizer Institute here, said in an interview. "It's difficult to see how we can avoid some geographic snugness in supplies."

The problems, he said, exist primarily east of the Rocky Mountains, where the regions hardest hit are the Southeast and the upper Middle West. Several plant closings have been reported in the Southeast and plants in the

Middle West are reported running at varying fractions of capacity.

The curtailments have cut industry operations by about one-third at a time when factories are normally producing at their peak to meet seasonal demands, Wheeler said. Production is being cut by 70,000 to 80,000 tons a week, he said, with about 400,000 tons lost thus far this year.

Natural gas is critical for nitrogen fertilizer production because it is both a raw material for the product and a fuel for the production process.

Hydrogen is stripped from the natural gas under intense heat and combined under intense pressure with nitrogen from the air to create a product called anhydrous ammonia. The ammonia is used both in its natural state and in combined forms with other plant nutrients.

While some plants can substitute oil for fuel, experts say, they have no substitute for the gas as a raw material. Wheeler believes that the total loss of production will reach about 750,000 tons of anhydrous ammonia, or a little less than 5 percent of normal production. Other estimates ranged from 600,000 to a million tons. □

There's never been a herbicide like this before.



"Translocation" is the key.

Roundup is applied to the weed foliage, absorbed through the leaf surface, and "translocated" throughout the entire plant. In this way, Roundup effectively destroys most weeds—roots, rhizomes and all.

Roundup® herbicide by Monsanto is powerful enough to control many of the toughest annual and perennial weeds in one application.

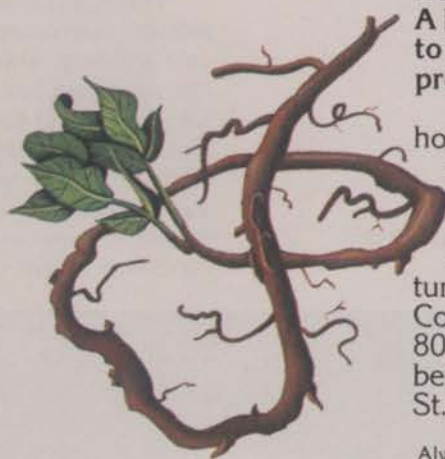
Once, several different herbicides and frequent repeat treatments were needed. Now, one man with a backpack or tank sprayer can handle many of your weed cleanup chores in one treatment with Roundup.

Roundup has more applications than you can imagine. For golf courses, schools, corporate and industrial parks. Wherever spot treatments are called for, Roundup makes sense. Especially when you consider what it can save you in time, labor and herbicide inventory.



Roundup destroys most emerged annual and perennial grasses and weeds.

Including bluegrass, bermudagrass, quackgrass, bindweed, johnsongrass, fescues, and vaseygrass.



Roundup. A herbicide that gets to the root of the problem.

To find out how to put Roundup at the root of your weed problems, write: Roundup, Monsanto Agricultural Products Company, C3NJ, 800 North Lindbergh Blvd., St. Louis, Mo. 63166.

Always read and carefully follow the Roundup label directions. RI 2/7



Roundup has no residual soil activity.

And you know what that can mean for your landscaping program. However, for seedling weed control, simply follow your Roundup treatment with an effective residual herbicide.

Monsanto



LAWN CARE MANAGEMENT

Developing a good chemical program

by Roger C. Funk Ph.D., director of research, Davey Horticultural Institute

Lawn care is big business. A number of lawn care services had gross sales last year of over 10 million dollars. Most of these services provide a dry or granular program which has long been the industry standard.

The liquid lawn services are relative newcomers to the lawn care industry, although custom lawn spraying has been practiced for a number of years. The Davey Company first began spraying lawns for white grub control in 1937. Lawn service evolved as a natural expansion of the tree and landscape services, and by the

early 1960s Davey was providing lawn fertilization and insect and weed control as part of their total plant care operations. However, it was not until 1974 that a separate division, Davey Lawnscape, was established to meet the growing demand for lawn services.

Anticipating the establishment of a separate lawn care division, the Davey Horticultural Institute began researching both liquid and dry programs to compare effectiveness, economy and market potential.

Granular fertilization programs had distinct quality advantages over the existing liquid programs providing more uniform turf response and less potential for fertilizer "burn" and herbicidal drift.

Plant nutrients are absorbed through the root system primarily from soil solution. Therefore, fertilizers must be solubilized before they are available for absorption. Nutrients from liquid fertilizers are already in solution when

Continued on page Z

Davey Lawnscape program in action today.





DACONIL 2787[®] **Pours it to nine fungus diseases.**

Broad-spectrum Daconil 2787 fungicide controls nearly all fungus diseases found on golf greens, tees and fairways, as well as many ornamentals.

It is highly effective against brown patch, copper spot, dollar spot and Helminthosporium in the spring and fall.

And now Daconil 2787 is available in either a convenient flowable or a wettable powder formulation.

Excellent turf tolerance permits use right on through the hot summer months.

Tested and used successfully on at least 35 species and varieties of turfgrasses, including all major bluegrasses, bentgrasses, bermudagrasses, ryegrass, fescuegrass, Dichrona and zoysiagrass. Can be used on new seedlings and established turf.

Follow the Diamond Shamrock Turf Care System for professional turf care over your entire golf course. Many of the leading country clubs across the nation already do.

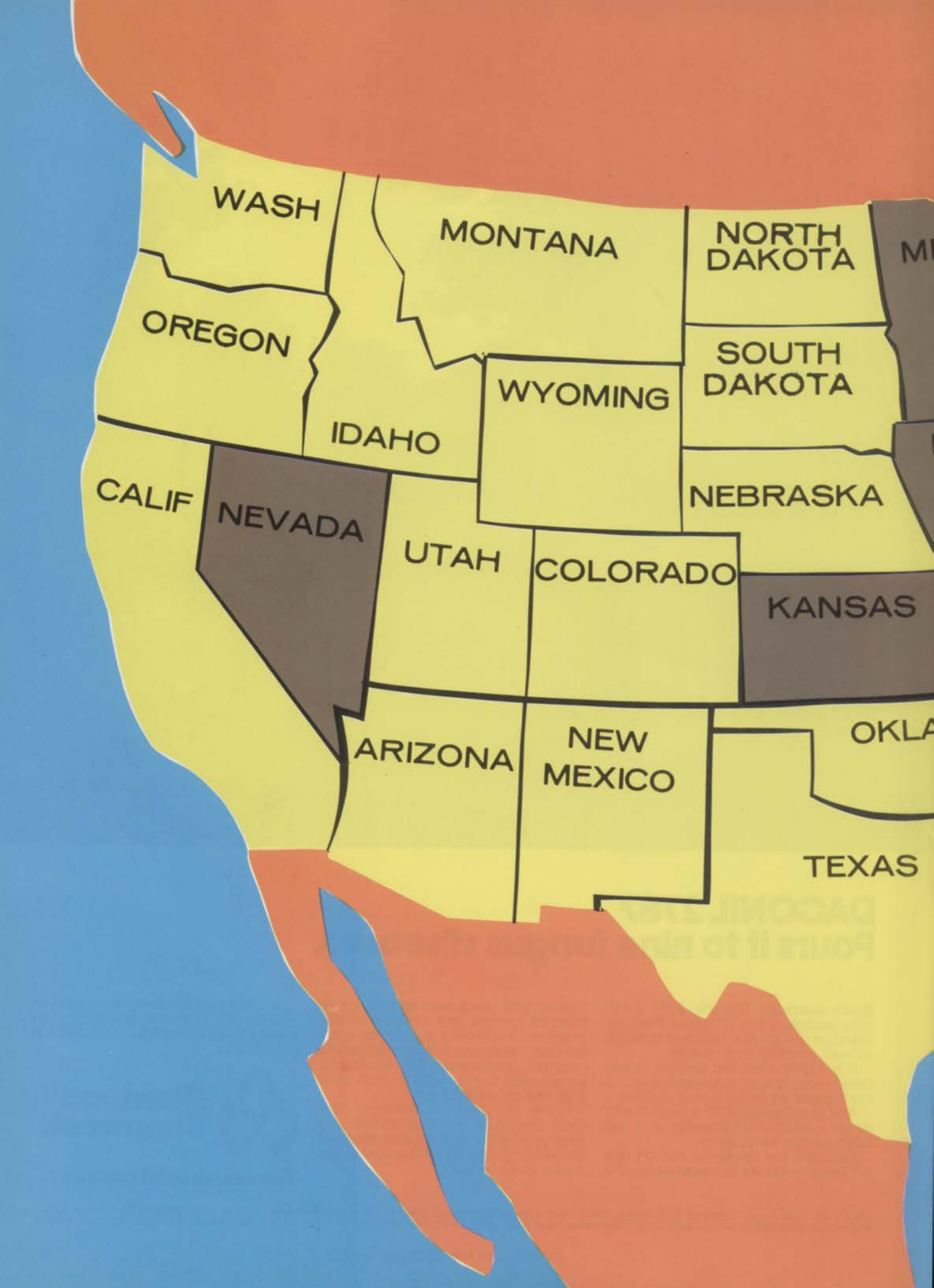
Contact your turf chemicals supplier or write the Diamond Shamrock Agricultural Chemicals Division sales office nearest you.



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The resourceful company.

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WASH

MONTANA

NORTH
DAKOTA

OREGON

SOUTH
DAKOTA

WYOMING

IDAHO

NEBRASKA

CALIF

NEVADA

UTAH

COLORADO

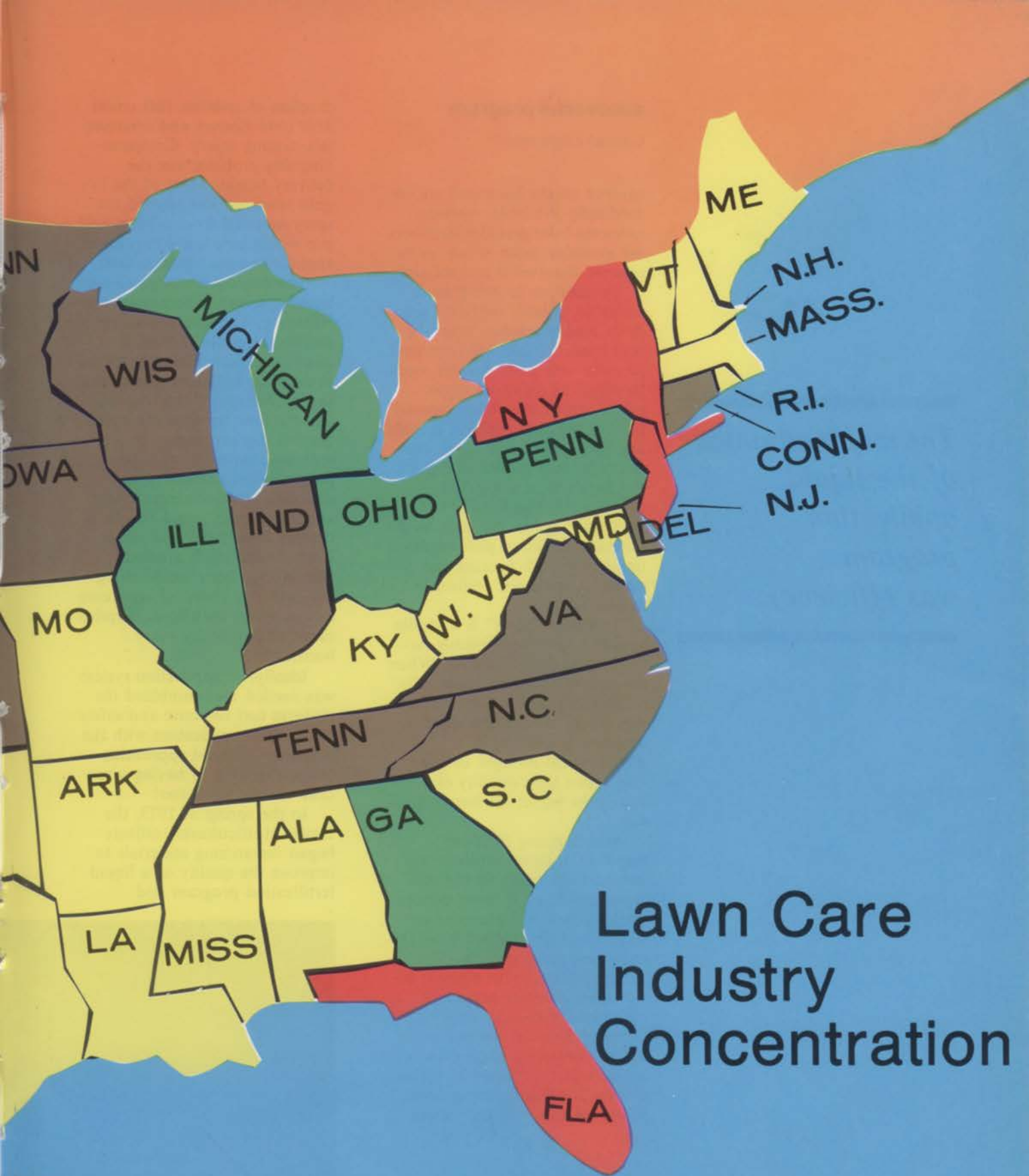
KANSAS

ARIZONA

NEW
MEXICO

OKLA

TEXAS



Lawn Care Industry Concentration

- States with the highest number of lawn care firms responding to survey
- 2nd highest group
- 3rd highest group
- 4th highest group.

*The major advantage
of the liquid
application
program
was efficiency.*

successful program

Continued from page V

sprayed on the lawn and are immediately available, whereas nutrients from granular fertilizers are available more slowly as the granule dissolves in soil solution.

In addition to being more available, soluble nutrients are more readily leached from the root zone. Soluble fertilizers tend to move with ground water much the same as dissolved sugar moves with coffee when poured from a cup. Thus, liquid soluble fertilizers produce a rapid, succulent flush of growth that quickly yellows from a nutrient deficiency as the soluble fertilizers leach below the root level. Granular fertilizers produce more uniform growth because the nutrients are more uniformly available.

Fertilizer "burn" is a visible symptom of excess soluble fertilizer salts in soil solution. When the concentration of these salts reach a critical level, the absorption of water by plant roots is suppressed resulting in physiological drought or burn. The higher the solubility of a fertilizer, the higher the burn potential.

Summarizing fertilizer response, soluble fertilizers are immediately available but will cause turf burn at lower concentrations than will granular fertilizers and are leached from the root zone more quickly.

In addition to the nutrient advantages, granular programs minimized herbicidal drift by applying granular herbicides or by the controlled application of large droplets of liquid herbicide. Conventional spraying systems produced many "fines," small

droplets of solution that could drift onto flowers and ornamentals causing injury. Compounding this problem was the delivery height. Most of the liquid lawn services applied the spray material from a hand-held gun which gave less control than applications near ground level.

The major advantage of the liquid application technique was efficiency. The selection of compatible materials allowed fertilizers and pesticides to be mixed in the spray tank and applied in a single application in about one half the time required for a comparable dry program. The economic potential of a liquid program was obvious since, although labor is necessary for application, no actual benefit is derived from labor but rather from the materials applied. Minimizing labor would bring the cost of a chemical lawn care service within the affordable price range of practically every homeowner.

Ideally, an application system was needed that combined the uniform turf response and safety of granular application with the efficiency of liquid application — something akin to having your cake and eating it too!

In the spring of 1973, the Davey Horticultural Institute began researching materials to improve the quality of a liquid fertilization program and

*Davey Tree
lawn maintenance
in 1937.*



methods of controlled delivery.

Powder Blue, a powdered ureaformaldehyde that forms a suspension in water was tested for physical and chemical compatibility with Davey spray equipment and application materials. Comparison tests demonstrated that, with the use of Powder Blue, turf response was comparable to the response from quality dry programs.

The use of a sprayable organic nitrogen source represented a major breakthrough in establishing a liquid application program as a quality service.

Herbicidal drift, which had plagued the liquid services, was minimized by the development of a convex, multiple-hole nozzle. Under low pressure, this design produced a "shower" of large droplets that could be applied 10 to 12 inches above the ground.

Confident that the two main disadvantages of liquid application would be solved, the Davey Horticultural Institute was conducting concurrent research to determine the most effective pesticides which would be compatible in the spray tank.

A tank mixture is potentially reactive and requires careful testing to prevent the selection of materials which could combine in the tank solution and either become phytotoxic or lose their effectiveness. Since the proposed application program incor-

porated various fertilizers, pre-emergent herbicides, post-emergent herbicides and insecticides, the testing procedures were quite extensive. Once compatibility was established, the materials were selected on the basis of effectiveness, availability and cost.

Fungicides were not included in the basic program because of the infrequent and unpredictable appearance of serious diseases in a lawn and because of the high material cost. Disease control would be offered as a special service and the customer counseled regarding the seriousness of the infection and the alternatives to chemical control.

The final technical decision before Lawnscape became a reality was personnel training. The importance of highly trained and motivated technicians was recognized as essential to the success of the operation. The lawn care section, which was being taught as part of the Davey Institute of Tree Science, was expanded into a complete program of lawn science, including those areas not directly related to Lawnscape services.

The research staff is committed to continued research and training, to provide the most effective equipment and materials to our personnel and to provide the highest quality service to our clientele. □

The use of a sprayable organic nitrogen source was a major breakthrough.



Building a lawn care business

Millard C. Dailey, president, Liqui-Green

Determined to transform my idea into actual practice, I visited several nurserymen.

In the spring of 1951, the idea occurred to me that liquid fertilizer could be sprayed directly onto lawns. In order to test my hypothesis, I applied some liquid fertilizer to my own lawn with a common sprinkling can. Much to my expectations, the results were fantastic and thus the foundation was laid for what was to become a most successful endeavour: Liqui-Green Lawn Spraying.

Determined to transform my idea into actual practice, I visited several nurserymen, a wholesale fertilizer establishment, and an independent businessman. Unfortunately, none of them shared my enthusiasm and rejected my idea on the premise that customer reception would be inadequate. Convinced that they really did not understand, I continued my campaign and went to an engineer. His affirmative response to my question, "Is it possible to build a truck with agitation and pump a liquid through 300 feet of $\frac{3}{4}$ inch hose in order to apply fertilizer to lawns?" was the inspiration that

spurred me onward. Very soon afterward, we went ahead and built such a truck that worked — but just barely. At the time, we did not have an electric reel, a gun designed for tree spraying, or lightweight hose (we were using rubber hose, which when filled with liquid, was like dragging a river around). Yet, crude as it may have been, it was a start.

The next obstacle I had to overcome was obtaining customers. Ironically, while I was having the truck lettered, a man happened by and inquired what the truck was for, because the wording on the side of the tank indicated it was for lawns and had aroused his curiosity. I explained my procedure to him and we agreed on the spot to spray his lawn — my first customer! That afternoon (without a teacher) I sprayed his lawn and once again, as I was working, I aroused the curiosity of a neighbor who was willing to try it also. Now, 26 years later, I still have both people as customers. Although one has moved several times, he

Continued on page EE



GOOSEGRASS

**SILVER
CRABGRASS**

CROWSFOOT

****@!!*#e!!**

**What you call it can't make it go away
...but Balan® can.**

Depending on where you are, Goosegrass gets called a lot of things. But no matter where you are, nobody calls Goosegrass an early riser. It doesn't get up and get growing with regular crabgrass in early spring. Goosegrass waits to make its appearance until six

to eight weeks after crabgrass germinates. And by the time you see it, there's not much you can do about it. But an application of Balan just before it begins to germinate is all it takes to put an end to your Goosegrass problems. Ask your Elanco distributor salesman to

help you work out a full-course Balan program.

**Elanco Products Company
a division of Eli Lilly
and Company
Department E-455
Indianapolis, Indiana 46206**

Circle 115 on free information card

ELANCO

Balan®



Balan's new granular form makes it even easier to apply.

We finally found a way to improve Balan...



Granules shown actual size

...we made it easier to apply!

Balan's new granular size lets you apply it like fertilizer, and makes it easier than ever to effectively control some of your tough weed grasses.

Balan gets the tough ones,

such as, crabgrass, foxtail, goosegrass and Poa annua.

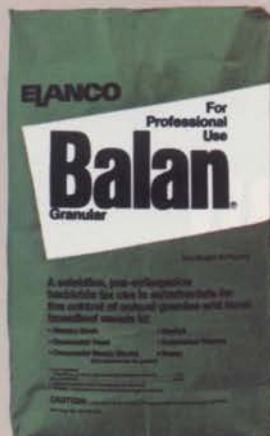
After ten years of proven success on thousands of acres of turf, Balan has become the nation's number-one granular pre-emergence herbicide. Its unmatched effectiveness and economy make Balan a "must" in every turf program.



Goosegrass
(crowsfoot, silver crabgrass and hard crabgrass)*



Poa annua
(annual bluegrass)



To get maximum effectiveness from your Balan turf program, contact the Elanco field representative in your area:

- Northwest**—M. D. Carlson
313 Almond Court, San Ramon, CA 94583
- Southwest**—R. C. Wortham
510 Pembroke Drive, Pasadena, CA 91107
- South**—S. C. Dolinak
3035 Directors Row, Suite 408, Memphis, TN 38131
- Northeast**—A. G. Ekeson
5 Campbell Road, Fairfield, NJ 07006
- Southeast**—M. E. Nealon
2776 Jo Beth Drive, Lawrenceville, GA 30245
- Midwest**—S. H. Springer
P. O. Box 50279, Indianapolis, IN 46250
- Midwest** — R. G. Baade
R. R. 6, Box 332A, Martinsville, IN 46151
- East**—R. E. Simmons
409 Hudson Ave., Staunton, VA 24401

ELANCO

Balan®

Circle 116 on free information card

building a business

Continued from page BB

always takes us with him. The business that was once only an idea grew to its present magnitude through proven end results, a lot of hard work, neighborhood curiosity and plenty of door-knocking.

From its very conception, I believed that an essential concept to follow was: to do a better job than the homeowner could do himself, at a cost which would be nearly what he would expect to pay for comparable materials. With this in mind, we established such a pricing method and have maintained it through present operations.

During the first year of operation, I was primarily concerned with teaching myself how to fertilize — then came weed control. Initially, we mastered this with a very bulky spray cart that required two men to function — one to push the cart and one to pull hose. It eventually became apparent that the first truck was not totally functional and the weed cart was less than tolerable. As the saying goes, "Necessity is the Mother of Invention,"; thus, I engineered a new piece of equipment for fertilizing purposes and went from a weed cart to open gun spraying, with the help of spray additives to reduce drift. Today we are using spray additives that are easier to handle, convenient and more efficient.

During the time that we were making equipment modifications, we were also upgrading our professionalism and image. In the lawn spraying business, I felt that this is our most important asset.

Today, our trucks are mounted with specially built 1200 gallon tanks and pumped by Power Take-Off Units with all gallonage metered. This is coupled with an attachment which allows the professional applicator to unreel the hose himself, and as he opens his spray gun, the engine speed is automatically increased to a predetermined level. Then, as the operator closes the gun, the

engine speed decreases to a slow idle. Also, the trucks are equipped with injectors which allows various products to be applied to a lawn from a single truck. This makes it possible for two or three lawns, side by side, to receive different treatments as they are needed.

In the area of weed control, we have maintained pace with the times by offering a wide variety of materials to handle special problems, such as knock-down, total kill or bare ground, fence-line control, selective control and brush control. We can even go up to the point of totally killing a lawn with a new product called Round-Up which allows seeding to follow immediately. That is, by taking a tall, fescue-ridden lawn that is intolerable, kill it along with whatever else may be growing in it, and then seeding into the killed lawn.

This allows the homeowner to have an entirely new lawn at a fraction of the cost of tearing out the old lawn, replacing it with sod, and then eventually ending up in the same predicament that originally caused the problem.

The homeowner, is aware that more is involved than just fertilizing and killing weeds. We have grown with the market and offer many other items such as crabgrass preemergence control, soil conditioners, insecticides, micronutrients and liquid lime.. In growing with the turf industry, we were confronted with yet another problem: fungus. In the beginning, very few products were feasible to apply from the standpoint of cost versus results. However, the suppliers have now developed combinations that must be used in a good maintenance program to insure professionalism in the turf-spraying industry.

Another subject we had to accommodate was trees. This came out of necessity because most of the clients believe that the sprayman is also an agronomist, entomologist, pathologist and tree expert. Therefore, we had to become familiar with all these areas. At first, we just did spray-

Continued on GG

*We were making
equipment
modifications and
upgrading our
professionalism*

Cut the cost of expensive horsepower and expensive manpower.



Bolens® HT-20 Tractor.

Jobs too small for big specialized equipment can add up to a punishing expense in manpower. Hauling. Mowing. Tilling. Grading. Loading. Trenching. Backfilling.

The intermediate size Bolens HT-20 Tractor can cut that expense by quickly adapting to over a dozen custom matched attachments including mower, tiller, bucket loader, back hoe, rakes, blades and brooms.

The foot operated hydrostatic transmission goes from forward to reverse without clutching or changing gears. Perfect for close-quarters work. Allows optimum power/speed combinations with hands free to operate hydraulics.

More than just a lawn and garden tractor, the HT-20 is powered by a 19.5 hp twin cylinder Kohler engine. The channeled steel frame, massive rear axle/differential and heavy duty front axle give a full day's work. Day after day.

Get more value from your big horsepower and expensive manpower. With the rugged HT-20. It fits right in-between. To save money on both ends.



Bolens Mulching Mowers.™

They cut the grass and the workload. In one pass. When a Bolens Mulching Mower cuts the grass, it also cuts and recuts the clippings into tiny particles that are blown down into the turf. There, they disappear and quickly decompose. No clippings. No clean-up. No thatch build-up. The fine mulch actually feeds the turf while the crew moves on to other jobs.*

3, 4 and 5 hp models are specially built for commercial and institutional use. Straight-thru steel axles, rugged all-steel deck, tough one-piece handle and positive cutting height adjustment. Bolens Mulching Mowers. Tough, economical answers to your continuing turf maintenance program.

*For a free copy of a University study on nitrogen return, contact FMC Corporation, Port Washington, Wisconsin 53074.

Bolens Mulching Mower is a trademark of FMC Corporation © Copyright 1977 FMC Corporation

See the complete line of Bolens commercial power equipment at your nearest dealer. For his name and address send the free response card or write, FMC Corporation, Port Washington, Wisconsin 53074.

FMC
Consumer
Products

building a business

Continued from page EE

ing and feeding of trees and shrubs. But a resistance to the sprayman's techniques emerged in the homeowners as a result of Rachel Carson's book, *Silent Spring*; then came the E.P.A. and laws. Fortunately, just about this time a company developed a tree injection system called Mauget, which allowed us to do almost the same thing we had been doing with the spray, so we immediately adapted to this method. From the beginning, we have constantly been looking for new and better ways to satisfy the tree and turf industry. We found that by listening to the universities, manufacturers, reading many trade journals and building our own library, we were able to stay abreast of the times and will continue to do so.

After accumulating over 20 years of experience and knowledge, I decided that since our procedures had been tested and successfully proven, why not offer this equipment and opportunity to others? In 1972, we started to franchise the entire operation, offering a full-service company. In order to maintain professionalism in our dealings with our customers, all operations are confined to within 150 miles of home-base. We work very closely with each franchisee, passing on information and continually training him to be a professional. We currently have many franchises throughout Illinois, Iowa, and Pennsylvania.

As in the beginning when we stimulated curiosity and recognition from our customers, we also became attractive to the manufacturers and universities.

We still make up a large portion of the total market. It is estimated that the turf industry has a gross volume of over 12 billion dollars; I believe that this is only a drop in the bucket compared to its potential dimension ten years from now.

For the industry to continue to grow we must be professionals and offer a wide variety of ser-

vices to the homeowner and industry. Federal laws will help all of us in the trade by making each of us aware of what a particular material will do and where it should be placed. Owners of such businesses will have to provide extensive services in the future with more and better trained personnel. Entirely too many operations have cropped up seemingly out of nowhere and have caused problems from the standpoint of image and professionalism.

Many customers still wait to be serviced, mainly because they are not aware of services offered. One of the greatest problems for the spray man is customer education. By informing the public, the sprayman can make more intelligent analysis of a particular turf problem and be accepted as a professional. In order for the sprayman to do his work well, he must be at all times the doctor, and the customer must be the nurse maintaining the lawn between applications.

Liqui-Green is going ahead every year in producing more turf specialists, with a high degree of professionalism by franchising the spray industry, standardizing procedures, tested and proven for results, and dealing in all problems of turf and trees. Our projections for the future are unlimited. □

In 1972 we started to franchise the entire operation, offering a full-service company.



WIPE OUT WITH BANVEL[®] 4S...

Banvel herbicides are broadleaf weed "specialists" designed for professional turf programs.

As a professional turf man you have a reputation to be proud of. And, rightly so! Your skill, knowledge and effort shows in the beauty and quality of your turf. So why take chances with understrength herbicides? Herbicides that get some broadleaf weeds but leave you with repeated deep-rooted problems—such as dandelions and plantain. Banvel 4S and Banvel +2,4D control all the major broadleaf weeds, and most of the time with just one application. Check the chart and compare your weed problems with the herbicides available.

Here's why Banvel herbicides are the professionals' choice for weed control

- When used as directed Banvel will not harm trees, ornamentals or grass—it just eliminates weeds.
- No season restrictions. Lay down Banvel from early spring to late fall—all through the growing season.
- Rain will not affect Banvel. It keeps working because it translocates—penetrates leaves and is absorbed through roots to attack every part of the weed.
- Banvel is not a soil sterilant. There is no residual reaction from Banvel as it is broken down in the soil by bacterial action. It is biodegradable.
- No special spraying equipment necessary. It is easy to clean out of equipment after use.
- Mixes readily with hard or soft water.
- Easily stored through winter months without losing potency.

WEEDS

BANVEL[®]+2,4D

herbicides...

Herbicide and Broadleaf Weed Susceptibility

Weed	2,4-D	Silvex	Meco-prop	Dicamba
Bindweed	S	S-I	S-I	S
Bittercress	S	S-I	S-I	S
Black medic	R	S-I	I	S
Buttercup	S-I	I	I	S
Carpetweed	S	S	S	S
Chickweed, common	R	S	S-I	S
Mouse-ear	I-R	S	S-I	S
Chicory	S	S	S	S
Clover, crimson	S	S	S	S
Hop	I	S	S	S
White	I	S	S	S
Cranesbill	S	S-I	S-I	S
Daisy, oxeye	I	I	I	I
Dandelion	S	S	S	S
Dock	I	I-R	I-R	S
Dogfennel	I	S	I	S
Garlic, wild	S-I	R	R	S-I
Ground ivy	I-R	S-I	I	S-I
Hawkweed	S-I	R	R	S-I
Henbit	I	S	I	S
Knapweed, spotted	I	S-I	I	S
Knawel	R	S	I	S
Knotweed	R	I	I	S
Lambsquarter	S	S	S	S
Lespedeza	I-R	S	S	S
Mugwort	I	I-R	I-R	S-I
Mustards	S	S-I	I	S
Nutsedge	I	R	R	R
Onion, wild	I	R	R	S-I
Ornamental plants	S-I	S-I	S-I	S
Woodsorrel	R	S	R	I
Pennycress	S	S-I	I	S
Pepperweed	S	S-I	S-I	S
Pigweed	S	S	S	S
Plantains	S	I	I-R	I-R
Poison ivy	I	S	R	S-I
Pony foot	S	I	I	S-I
Prostrate spurge	I	I	I	S
Purslane	I	S-I	R	S
Red sorrel	R	I	R	S
Shepherdspurge	S	S	S-I	S
Speedwell	I-R	I-R	I-R	I-R
Spotted spurge	I-R	I	S-I	S-I
Thistle, musk, curl	S	I	I	S
Thistle, Canada	I	I	I	S
Vegetables	S	S	S	S
Wild carrot	S	S-I	S-I	S
Wild strawberry	R	I	R	S-I
Yarrow	I	I-R	I-R	S
Yellow rocket	S-I	I	I	S-I

S = weed susceptible; I = intermediate, good control at times with high rates, sometimes poor, usually require more than one treatment; R = resistant weeds in most instances.

Chart reprinted by permission, S. Wayne Bingham, Ph. D.

"Two" is better!

Some weeds simply aren't affected by single herbicide treatment. But Banvel + 2,4D has an "additive effect" in that the two herbicides get weeds that one alone just weakens.

Banvel herbicides—products for professional turf men



Circle 124 on free information card

Velsicol

Velsicol Chemical Corporation
341 East Ohio Street • Chicago, Ill. 60611

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WTT-377

**Lawn Care
Management**

The name of the game is service

"The key is caring and all of our people care," this, says Marty Erbaugh, general manager of the Davey Lawnscape Co., is what makes his company a steadily growing one in a most competitive field.

Davey Lawnscape is a division of the Davey Tree Expert Co., a company which has built a reputation on customized service. "The whole idea of not customizing service is new for Davey," says Erbaugh. "With our lawnscape company we now have a streamlined service. But I believe our customizing policy continues through our personnel. We try to make each client feel they are getting the best service for their money."

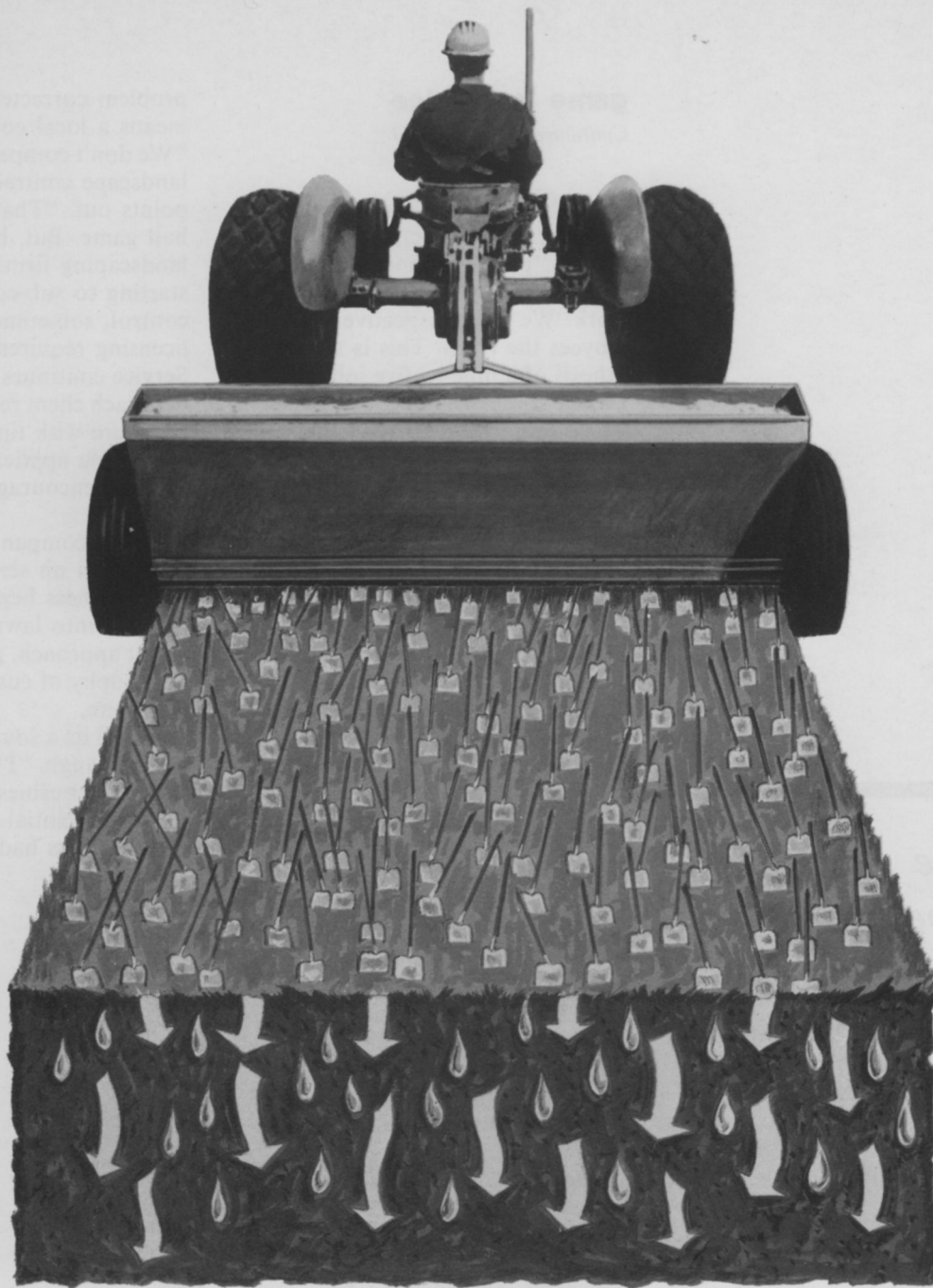
A lofty goal but Davey's game plan is sound. Each member of the lawnscape team must take a comprehensive 40-hour course on the principles of lawn care. And they must continue taking the course until they get a perfect score.

The course covers insects, weeds and diseases and identification, water and mowing and is constructed on the building block theory. First the student learns what the subject is, then how the controlling product works, then why it works. This comprehensive background enables all personnel to answer clients' questions or at least understand them enough to put them on the right track for answers.

"Davey's great big plus is our secretaries," says Erbaugh. "They are the first people our clients talk with. Since this is a very complaint-oriented business, if our clients can be helped on the first phone call, they are happy and we are happy."

Hiring, of course, is one of the most important aspects of

Continued on page LL



Low cost conditioner loosens clay!
Works like millions of tiny hoes.™

Sof'n-soil™ Gypsum works its way down to break up compacted clay soil so it can breathe, lets air and water penetrate, boosts efficiency of costly fertilizers. A natural mineral, Sof'n-soil produces vigorous root systems, promotes growth of grass, trees, shrubs, and flowers. Ecologically safe, Sof'n-soil is



not a lime. It's neutral, non-caustic, non-burning—harmless to plants, pets, and people. And here's a bonus: Sof'n-soil supplies soluble calcium and sulfate sulfur in readily available form, stimulates decomposition of organic materials, too. Write to us at 101 S. Wacker Dr., Chicago, Ill. 60606. Dept. WTT-37.

CHEMICALS DIVISION

UNITED STATES GYPSUM
 Primary supplier of secondary plant nutrients

Circle 118 on free information card

KK

game is service

Continued from page JJ

Davey's lawnscape business. "We look for self-starters," says Erbaugh. "People who want to do a good job, who take pride in their work. We tell prospective employees the truth. This is the antithesis of a nine-to-five job. Sure we lose some of our people. Eventually some want to start their own businesses, but this is the nature of the individual."

All of Davey's lawn care managers and district managers begin as technicians, riding on the trucks. "This," explains Erbaugh, "gives them a clear understanding of what the business is all about. Their job entails looking a prospective client's lawn, gathering soil for a pH analysis, checking thatch and aeration and anticipating any problems which could arise. Then they call back with estimates. "Our people don't hype clients and this takes style," says Erbaugh.

Where does Davey find its future managers? At Ohio State, the Ohio Agricultural Research and Development Center, and Penn State, to name a few schools.

"We find a large percentage of the people we hire have a B.A. in business administration," says Erbaugh, "and we even have an M.B.A."

This personnel philosophy is far from idyllic. It is sound business judgement, according to Erbaugh. "Our product is service. And we need the kind of intelligent, qualified people who can provide it if we are to continue to grow. After all, a client could do this work himself if he has the time. We are offering to do the work for him at equal to or a little less than what it would cost for him to buy the products to do the jobs we cover with our four applications."

But Davey's service goes beyond the four applications. Should a client have a problem not covered in the program, such as aeration, thatching or fungus, the Davey technician will tell him about it and where to go to have the

problem corrected. This usually means a local contractor.

"We don't compete with the local landscape contractor," Erbaugh points out. "That's a different ball game. But, he adds, good landscaping firms are now starting to sub-contract weed control, sometimes because of licensing requirements.

Service continues beyond personnel. Each client receives a 20-page brochure with tips related to the four basic applications and are actually encouraged to ask questions.

And so a company which built its reputation on service in the tree care business begins a major expansion into lawn care. A different approach, perhaps, but the philosophy of customer service is still there.

"We feel its a sound investment," says Erbaugh. "I fully believe the lawn care business today has the growth potential that the tree care business had 50 years ago."

"A large percentage of our people have a B.A. in business administration."

Pramitol weed killer gives you nothing.

Pramitol® is the industrial herbicide that gives you nothing—but what you want. Beautiful, weed-free, bare ground.

Pramitol gives you season-long control of most broadleaf weeds and grasses. Including tough perennials.

With Pramitol you get both contact and residual kill. So you can quickly eliminate undesirable vegetation. And, at the same time, prevent germinating weeds from ever seeing the light of day.

What's more, Pramitol 25E is regis-

tered for use both under asphalt. And in a mix with cutback asphalt.

If there's an area you'd like to keep bare-ground clean for vehicles, storage or anything else, see your chemical supply dealer about Pramitol Industrial Herbicide. It's the one thing that gives you nothing. But weed-free, bare ground.

Or write, Agricultural Division, CIBA-GEIGY Corporation, P.O. Box 11422, Greensboro, NC 27409

Circle 101 on free information card



CIBA-GEIGY

Chemical Lawn Care, the growingest new marketplace.

And no one really reaches it but Weeds Trees&Turf.

We've added 4,791 Chemical Lawn Care professionals to our circulation. And no one is there but us. Because no one else has performed the exhaustive research necessary to identify the people in this high volume marketplace.

Which makes Weeds Trees&Turf the only place for you to go to reach this market effectively.

Not just because of the millions of dollars the Chemical Lawn Care people spend, either. We have the highest circulation and the best CPM in the entire vegetation management marketplace.

Get growing with us.

WEEDS TREES & TURF

Contact Dick Foster, Ad Director, 9800 Detroit Ave., Cleveland, Ohio

Easy-mixing SEVIN*4 Flowable gives broad spectrum insect control

SEVIN 4 Flowable controls over 30 kinds of insects on shade trees and ornamentals — from aphids to willow leaf beetle.

- Stauffer's flowable formulation is easy to mix and apply.
- Uniform deposit, long-lasting.
- Ideal for shade trees, shrubs, flowers, also fruit trees, gardens and turf.

See your Stauffer supplier for SEVIN 4 Flowable. Always follow label directions carefully. Ask him also for these other dependable Stauffer products: Aspon[®] insecticide for chinch bugs in turf, Betasan[®] herbicide for golf turf, lawns, Eptam[®] herbicide for ornamentals, sand traps, Vapam[®] soil fumigant to clean up planting sites. Stauffer Chemical Company, Agricultural Chemical Division, Westport, Connecticut 06880.

Sevin*
4 Flowable

Stauffer
CHEMICALS



*Reg. T.M. Union Carbide Corporation

Circle 131 on free information card



THE 44-INSECT INSECTICIDE.



For trees, ornamentals, and turf.

One solution versus 44 problems. Those are pretty good odds.

Especially since you can't always be sure which insects will threaten the valuable trees, turf and ornamentals you protect. And people enjoy.

This broad-spectrum control with SEVIN® carbaryl insecticide takes some of the chance out of your job.

Its versatility also lets you cut down on

STOP! ALL PESTICIDES CAN BE HARMFUL TO HEALTH AND THE ENVIRONMENT IF MISUSED. READ THE LABEL CAREFULLY AND USE ONLY AS DIRECTED.

the need for a large chemical inventory.

Why use an array of different brands with different instructions, if you can do the job effectively with a single product? You'll enjoy less nozzle changing, chemical switching and tank flushing. All good reasons to rely on dependable SEVIN.

Use it in any of its available forms to suit your needs. Choose from wettable powders, flowables and liquid SEVIMOL® 4.

And many SEVIN formulations are compatible with most commonly used fungicides, miticides and other insecticides.

With the increased awareness and concern for protecting the environment, it's nice to know that SEVIN carbaryl is biodegradable. It does not build up in the soil or in plant and animal tissue.

Also, when compared with many other insecticides, SEVIN ranks low in toxicity to people, animals, birds and fish.

There's another advantage to using SEVIN in parks, golf courses and other recreational areas—even home yards and gardens. Short re-entry time. Treated areas can be re-entered as soon as the spray dries or dust settles.

PLANTS	INSECTS CONTROLLED
HERBACEOUS ANNUAL, BIENNIAL AND PERENNIAL PLANTS such as carnation, chrysanthemum, gladiolus, iris, peony, zinnia, etc.	blister beetles, boxelder bug, flea beetles, Japanese beetle, June beetles, lace bugs, leafhoppers, leafrollers, mealy bugs, plant bugs, psyllids, rose aphid, thrips (exposed)
SHRUBS, TREES AND WOODY PLANTS such as ash, arborvitae, azalea, barberry, beech, birch, boxwood, catalpa, cedar, cypress, dogwood, elm, euonymus, fir, ginko, hackberry, hawthorn, holly, honeysuckle, hydrangea, juniper, lilac, magnolia, maple, oak, pine, redbud, rose, spruce, sycamore, tulip-tree, etc.	apple aphid, bagworms, birch leaf miner, boxelder bug, boxwood leaf miner, cankerworms, catalpa sphinx, Cooley spruce gall aphid, Eastern spruce gall aphid, elm leaf aphid, elm leaf beetle, elm spanworm, eriophyd mites, gypsy moth, Japanese beetle, June beetles, lace bugs, leafhoppers, leafrollers, mealy bugs, mimosa webworm, oak leaf miner, orange striped oakworm, orange tortrix, periodical cicada, plant bugs, puss caterpillar, rose aphid, roseslug, saw flies (exposed), scale insects, spruce needle miner, tent caterpillars, thorn bug, thrips (exposed), webworms, willow leaf beetles, yellow poplar weevil
LAWNS, TURF	ants, bluegrass billbug, chiggers, chinch bugs, cutworms, earwigs, European chaffer, fall armyworm, fleas, green June beetle, leafhoppers, millipedes, mosquitoes, sod webworm (lawn moths), ticks

NOTE: SEVIN will injure Boston Ivy, Virginia Creeper, and Maidenhair fern.

Make a quick check of the plants and insects for which SEVIN carbaryl is registered. See how many problems it can solve for you. In all there are over 160 pests on more than 100 plants. This broad registration minimizes the problem of drift to adjacent areas.

This year, ask your pesticide supplier for SEVIN carbaryl—the insecticide with a proven performance record in fighting plant pests.

SEVIN®
CARBARYL INSECTICIDE
STILL THE ANSWER.

SEVIN and SEVIMOL are registered trademarks of Union Carbide Corporation for carbaryl insecticide. Union Carbide Corporation, Agricultural Products Division, P.O. Box 1906, Salinas, CA 93901.

Announcing the all new

Ross ^{SUPER} Tree Stakes™

**Here's great news
you can stake
your professional
reputation on!**

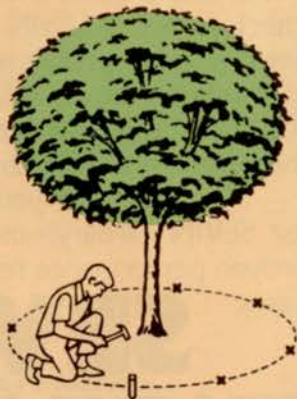
The ROSS Super Tree Stakes, with their pre-measured once-a-year formulation work on trees, evergreens, shrubs and bushes. Our high food value formulation 16-10-9 plus Iron and Zinc, helps promote fast, healthy growth.

These all-purpose stakes will help you cut costs, too . . . Each case of 160 stakes is enough to feed over 35 3" diameter trees. One application of this quality formula usually lasts all season.


Made to the exacting standards Ross Daniels, Inc. is noted for, these new stakes can be used either spring or fall, whenever time is most available to you and your crews.

Simple and easy to use, you just drive three Stakes for every 2" of tree trunk diameter into the ground at the tree drip line. Water does the rest, carrying plant food to the feeder roots.

Be sure to ask for *ROSS* Super Tree Stakes. Available at your regular Ross distributor or write:



Ross Daniels, Inc., P.O. Box 430, West Des Moines, Iowa 50265

A Public Service of this magazine & The Advertising Council 



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too.**

Red Cross needs individual volunteers, and donors of blood and money, by the millions.

But we need even more help. We need the solid support of American Business. And we never needed it more.

If your business is already helping, by organizing blood drives, and by supporting payroll deductions—either directly for the Red Cross, or through the local combined fund drive—the whole community owes you thanks. And we thank you, too.

Last year, with help from our friends, we offered major aid at over 30,000 disasters—from typhoons, to local (but just as devastating) house fires.

We were able to help the elderly with practical programs, we helped veterans by the hundreds of thousands, we taught people by the millions to swim or swim better. And that's just the tip of the iceberg.

Think of America without The American Red Cross.

And you'll know why we need your business as a Red Cross Volunteer. In your community. And all across America. Contact your local Red Cross Chapter to see how your company can become a volunteer.

**Red Cross.
The Good Neighbor.**

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BRAND

BROADLEAF HERBICIDE

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PO-SAN prevents 85-100% of Poa annua seedhead formation; retards Poa growth; and helps the desirable grasses to take over in the spring. In early fall, PO-SAN actually controls seedling Poa annua; stunts the mature Poa while greatly reducing seedheads; and gives overseeded grasses a big advantage in competing with this vigorous weed.

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When Americans were asked about the effect of profits on their personal lives, they gave some surprising and conflicting answers. A number of people said that when business profits go up, the prices of things they buy go up. But more and more, the opposite—that many profits have gone down, the prices of things they buy have gone up—has become the dominant view.

All of this helps point up a serious problem: if we citizens don't understand the basic functions of our American Economic System, how can we make intelligent decisions about it? How do we know what to keep, what to change?

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Every American ought to know what it says.


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128 pages of your own money cost.

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 Please send me a free copy of the booklet without any money cost.

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Did you know? Over the 10 year period 1965-74, an average U.S. manufacturer increased his net after tax profit of sales by 183% while 30% of corporate profits went to stockholders. 50% to top executives. 10% to other employees. This booklet is available for \$2.00 in the U.S. only.



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A Public Service of The Advertising Council



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High Blood Pressure is the country's leading contributor to stroke, heart disease and kidney failure. Any of which can kill.

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But still, while the time bomb is ticking away.

Until, suddenly, it explodes.

But you can help. By giving your employees a chance to check their blood pressure. It takes only seconds to measure a person's blood pressure. And it's possible. Best of all, your own medical or nursing personnel can do the job, simply.

When a case of High Blood Pressure is detected, the employee is then referred to a doctor for treatment. And treatment is usually as simple as taking a pill every day.

To help you implement this life-saving program, we have a special kit, "Guidelines for High Blood Pressure Control Programs in Business and Industry." The kit includes complete instructions on screening, publicity, referral, follow-up, education. And more.

Send for your kit today. It may be the best thing you've ever done for your employees. And your company.


A Public Service of The Advertising Council

Mail to: National High Blood Pressure Education Program
 1220 Eastwood Avenue, Suite 100
 Room 101-C, Lawrence City, Indiana 46204

Please send me _____ (copies) of "Guidelines for High Blood Pressure Control Programs in Business and Industry."

Name _____
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 Company _____
 Address _____
 City _____ State _____ Zip _____

A HIGH BLOOD PRESSURE Treat it...and live.



The Advertising Council is the biggest advertiser in the world. Last year, with the cooperation of all media, the Council placed almost six hundred million dollars of public service advertising. Yet its total operating expense budget was only \$914,683, which makes its advertising programs one of America's greatest bargains... for every \$1 cash outlay the Council is generating over \$600 of advertising.

U.S. business and associated groups contributed the dollars the Ad Council needs to create and manage this remarkable program. Advertisers, advertising agencies, and the media contributed the space and time.

The Advertising Council is a voluntary organization that promotes the public good by conducting information and action campaigns in such areas as support for higher education, drug abuse prevention, rehabilitation of the handicapped, traffic safety and many others. Recently, it added an exciting new campaign to its list: one to encourage Americans to learn more about our economic system.

Yet this donated creative effort, time, and space are not enough to do the job. Money is necessary to operate: Money to service thousands of mass media outlets with the materials needed to publish or broadcast the advertising message.


Your company can play a role. If you believe in supporting public service efforts to help meet the challenges which face our nation today, then your company can do as many hundreds of others—large and small—have done. You can make a tax-deductible contribution to the Advertising Council.

At the very least you can, quite easily, find out more about how the Council works and what it does. Simply clip and mail the coupon below. You'll receive material which tells how American management is helping to solve many of today's problems.

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Please send us your material

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The cost of preparation of this advertisement was paid for by the American Business Press, the association of specialized business publications. The space was donated by this magazine.

"They cut down a lot on labor costs."

Tony Kimball, Superintendent, Deerwood Country Club, Jacksonville, Florida

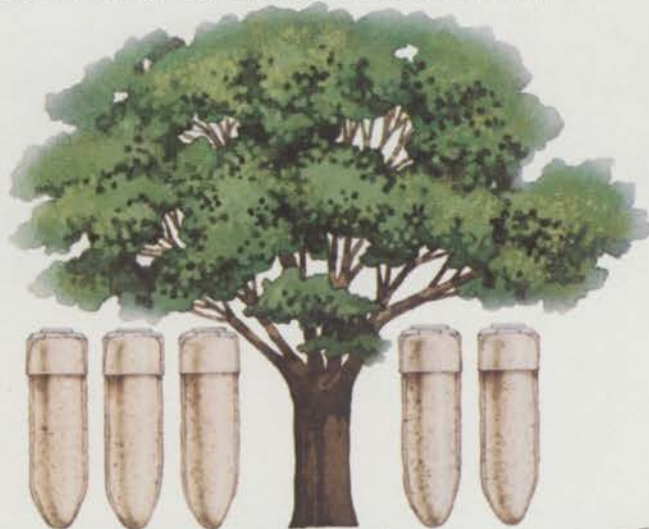


"We put Jobe's Spikes out in no time at all. We bought the first cases on an experimental basis, and we're really pleased with them. We'll continue with the Spikes.

"We can afford to feed a lot more trees now because we can do it in a lot less time."

It makes dollars and sense to feed trees with Jobe's.

You can expand your tree feeding business and take better care of the trees you're now responsible for with Jobe's® Tree and Shrub Spikes. A 5' tree needs 5 Spikes, and it takes just about 5 minutes to get the job done. How long would it take to feed that 5" tree by drilling? About 30 minutes? With the cost of labor these days, you can see it makes dollars and sense to feed trees with Jobe's.



5" trunk diameter, 5 Spikes.

"We use one for each inch of diameter. Figuring, say, a 5" tree, that's \$1.50 a tree. If we weren't using Jobe's Spikes, we would probably be using a slow-release, high-nitrogen fertilizer. Compared to that, the cost is drastically cut by using Jobe's Spikes."

Now Jobe's offers Evergreen and Fruit Tree Spikes, too.

You can meet most feeding situations with Jobe's Tree and Shrub Spikes 16-8-8, Evergreen Spikes 12-6-8 or Fruit Tree Spikes 5-15-15.

They're as effective as drilled fertilizer because rainwater carries the fertilizer down to the root zone. (University leaching

studies have proved it.) Jobe's Spikes are better than surface-applied fertilizer because there's no danger of burning turf or excessive leaching.

In every type of climate and every kind of soil from sand to heavy clay, Jobe's Spikes have proved their effectiveness.

A hammer is all the equipment you need.



Jobe's Spikes use a patented binder so the fertilizer forms easy-to-drive spikes. A plastic cap is included to make driving the Spikes easier and to protect the Spike while you drive it.

You can forget about moving bulky drills from job to job. Forget equipment breakage... maintenance bills ... costly replacements.



"You don't have to worry about anybody going out there and messing up."

"You can't mess up with Jobe's Spikes. Until now we fertilized trees by drilling or by spreading fertilizer on the surface. With Jobe's you don't have to worry about burning. You don't have to worry about the bag splitting.

"Very handy and easy to install around trees. They cut down a lot on labor costs."

Tony Kimball is saving time and making money with Jobe's.

How about you?

Jobe's Evergreen Spikes 12-6-8 and Fruit Tree Spikes 5-15-15 are now available in bulk. They can be combined for shipping with Tree and Shrub Spikes.

Call your local Jobe's distributor or order direct. \$30 per case (105 Spikes) prepaid, 5 case minimum. 15 or more cases, \$25 per case. 36 or more cases, \$21 per case.

Jobe's® TREE & SHRUB SPIKES

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DACTHAL®...the leading weed control for crabgrass and Poa annua.

Dacthal preemergence herbicide drives 17 troublesome weeds right off the course! It's death on crabgrass and *Poa annua*, when used according to label directions.

Yet, Dacthal can be used on nearly all turf grasses and 120 flowers and shrubs. Just follow label instructions.

Apply Dacthal in early spring to control crabgrass as well as annual grasses and broadleaf weeds. A second application in late summer knocks out late-

germinating grasses such as *Poa annua*.

For control of creeping speedwell (*Veronica filiformis*) apply Dacthal as a *postemergence* spray in the spring or early fall. And, for beautiful turf over your entire course, look into the Diamond Shamrock Turf Care System. It's the nearest thing to total protection from fungus diseases and weeds.

Dacthal is offered in wettable powder or 5% granules.

See your turf chemicals supplier or write the Diamond Shamrock Agricultural Chemicals Division sales office nearest you.



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Superintendents urged to use wastewater

PORTLAND, ORE., FEB. 10 — Golf course superintendents from around the country were urged here today to consider using sewage effluent for irrigation to help conserve water.

James W. Adams, group vice president for irrigation of The Toro Co., speaking at the annual conference and show of the Golf Course Superintendents Association of America, said use of effluent for golf course irrigation is already being practiced in the U.S. and will expand rapidly in the next few years.

By using effluent, Adams said, superintendents will reduce their water costs and gain some soil nutrients, in addition to helping to conserve water. Use of effluent for irrigation also could help reduce the cost of sewage treatment and disposal for local governments, he added.

Adams said his company has identified about 50 golf courses in

the U.S. that are using treated wastewater for irrigation.

There are more than 30 in California; at least a half-dozen in both Arizona and Colorado, and one or more in Texas, Florida, Illinois, Idaho, Missouri, New Mexico, Nevada, New Jersey and Pennsylvania and probably several other states, he said.

Some golf courses now operating could not continue without wastewater, he declared.

Adams said the amount of wastewater available for irrigation is going to expand dramatically in the next few years, mainly as a result of action by the Environmental Protection Agency. The EPA now requires municipalities applying for grants for sewage treatment facilities to prove the proposed facilities meet the best possible cost-effective criteria. This, he predicted, will encourage on-land disposal.

Additionally, he said, other

pollution control authorities — state and county — are making it very difficult, if not impossible, to discharge treated wastewater into receiving waters.

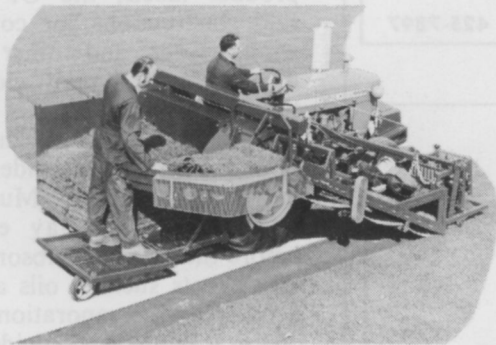
Adams said the military has been in the vanguard of users of wastewater for golf course irrigation. Fitzsimmons Army Hospital in Denver probably was the first, starting in 1940.

Golf courses at Fort Huachuca in Arizona, and March Air Force Base in California also have been irrigated with wastewater since the early 1940's.

Other military facilities whose treated sewage is used for irrigating their golf courses are: Marine Corps facilities at Camp Pendleton, El Toro, and Twenty nine Palms, CA; the Air Force Academy and Fort Carson, in Colorado; George Air Force Base, CA; Reese Air Force Base, TX; China Lake Naval Weapons Center, CA; and Scott Air Force Base, in Illinois. □

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- ★ NOW AVAILABLE with Large Floatation Tires — 19.5 x 24.

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Our agronomist will be pleased to consult with you on any problem areas; our prices are as follows:

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Crownvetch plants in peat cubes or peat pots:

100, 22¢ each; 600, 20¢ each; 1100, 19¢ each; 2600, 18¢ each; 5100, 17¢ each.

These prices include packaging and free delivery within a 500 mile radius. Beyond 500 miles, add 1 cent each on plants only.

For information on seed to meet state specifications, and attractive brochure, write or call:

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Brief labels for pesticides not practical

Like many other users of pesticides, you may wonder why the instructions for using a herbicide or insecticide are so long and complicated. If you want a product label that will tell the whole story in 25 words or less, a University of Idaho expert can give you 100 good reasons why this hoped-for brevity would not be to your advantage.

"Pesticides can be used effectively only when the applicator understands the characteristics of the product he is using — and that's the information you get on the product label," Glen A. Murray, professor of plant and soil sciences, said at the UI Plant Protection Seminar.

Users of agricultural chemicals cannot expect good results if they ignore the warnings included on the product labels, the UI professor said. Instructions for coping with wind, water and other environmental factors merit close attention, he said.

"Under hot, dry, windy conditions, spraying a pesticide on plants may do little good," Murray said. "The pesticide may evaporate before the plant can absorb it. Wetting agents such as oils and detergents reduce evaporation and decrease loss of the pesticide."

Soil-applied pesticides may encounter many barriers that prevent contact with plant roots and underground shoots, he added.

"The pesticides may be lost through leaching or soil erosion. Light, chemicals or soil microorganisms may break down the pesticides, making them ineffective," he said.

As a guide to effective use of pesticides, Murray offered this short, clearly worded slogan: "Read the label and follow the instructions to the letter." □



Them.

There are plenty of monofilament trimmers on the market; all quite similar in appearance.

But before you buy, take a close look. Because one, The Green Machine—the country's best-selling gas-powered monofilament trimmer—is much more than just a great monofilament trimmer.

It's also a great brush cutter...and a great tree and vine pruner.

The Green Machine's unique PowerStik™ design lets you work with maximum performance overhead, on the ground, and at all levels in between.

Using quick-change accessories, The Green Machine will trim, prune or cut just about everything in the yard. From the most delicate grasses, to three-inch thick tree branches. You'll replace a whole range of hand trimmers, pruners, clippers, edgers—even chain saws in most pruning and thinning operations.

We could almost say the

only other yard tool you'll need is a lawn mower.



Remember that The Green Machine is gas powered. There are no cumbersome electrical cords to worry about. The powerful, lightweight 22.5 cc engine gives you torque to do the full range of jobs without the stalling-out problem often found with electrical units.

But performance is only one reason to buy a Green Machine.

Quality is the other. The Green

Us.

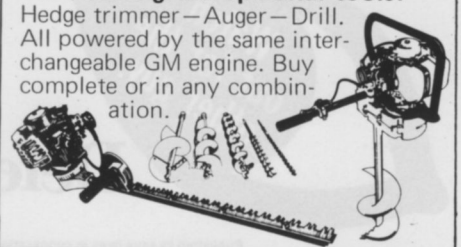
Machine is engineered throughout for easy starting and long hours of trouble-free operation. Parts and service support are nation-wide.

So, don't settle for a tool that does only part of the job. Monofilament trimming is great. But for complete grounds care you need number one. Us. The Green Machine. The Trimmer-Cutter-Pruner.

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Plus these great optional tools:

Hedge trimmer—Auger—Drill. All powered by the same interchangeable GM engine. Buy complete or in any combination.



Versatility makes it number one.

The Green Machine™

Penn State publishes "Street Trees" manual

The College of Agriculture at The Pennsylvania State University has published a manual entitled "Street Trees," designed to assist people taking part in planning and carrying out street beautification programs in urban areas.

"This manual has been prepared for use by shade tree commissions and professional horticultural firms who plan and carry out tree planting and maintenance," stated Dr. Roland R. Daniels, assistant professor of environmental horticulture and author of the publication.

Topics include site and variety selection, site preparation, plant-

ing, and care and maintenance following planting. Included in an appendix are: (1) a checklist of current street plantings and analysis of potential planting sites; (2) proposed specifications for selecting, planting, and maintenance of street trees within developments; (3) general specifications for deciduous shade and flowering trees; (4) standards of workmanship for tree care and maintenance; and (5) suggested contract specifications for establishing and maintaining street plantings.

Two other features are a tree hardiness zone map of Pennsylvania and an outline of characteris-

tics for trees suitable for planting in the Commonwealth.

The manual may be purchased for \$2.12, tax included, from STREET TREES, Box 6000, University Park, PA 16802. Make checks or money orders payable to The Pennsylvania State University.

Typical of comments regarding the manual is this statement from a teacher in Canada: "Your publication is a significant contribution to the popular literature describing aesthetic horticulture and urban forestry tree selection and maintenance. It should have wide application throughout northeastern North America." □



NEW NO DRIFT HERBICIDE APPLICATOR


The weed killer is applied to the ground by the ribbed roller right alongside borders with no possibility of drift onto shrubs and flowers. There is no waste. The herbicide is applied evenly and exactly where you want it.

Models from 18" to 36" wide; 1½ to 6.6 gallons

36" Model

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Published to save lives in cooperation with The Advertising Council and the National Safety Council.



Only way to total lawn weed control!

Super D WEEDONE® applied by METER-MISER®




Dealers and Contractors. Need a METER-MISER? Contact your Distributor or Amchem.



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A turfgrass fertilizer unlike any other fertilizer you can buy.

It's Scotts ProTurf High Density Fairway Fertilizer...and the name tells the kind of beautiful, vigorous results a commercial turf manager like you can expect.

Scotts...the grass people. More than a century of experience in making things grow.

ProTurf...Scotts commercial turf division. It means this is no garden store variety of turf product. It's developed, manufactured and sold specifically — and exclusively — for schools, colleges, golf courses, landscape contractors, lawn service companies, cemeteries, parks, sod growers and other professional users.

High Density...a combination of both fast-acting and controlled release forms of nitrogen. And each individual granule is the same analysis that's printed on the bag...a completely homogeneous fertilizer preventing the separation of nitrogen, phosphorus and potassium for an exceptionally even distribution of nutrients. So each and every plant gets the nutrients you've selected.

It spreads quickly and easily. And is safer for your turf than many commercial fertilizers. When compared to a 12-4-8 fertilizer, it saves you two-thirds of the storage space and reduces labor by as much as fifty percent because of fewer bags per acre to apply.

Fairway Fertilizer...originally developed to meet the needs of golf course superintendents for a high quality, high nutrient, non-burning, long lasting maintenance fertilizer.

ProTurf High Density Fairway Fertilizer is now applied by thousands of turf managers in the United States and Canada in all sorts of use and environmental conditions.

But find out for yourself. Try Scotts ProTurf High Density Fairway Fertilizer on your turfgrass this season. The proof will be in the results.

All ProTurf products are sold directly to professional users only (no distribution network to add to the price). For more information about High Density Fairway Fertilizer or our fifty other fertilizers, fungicides, insecticides, herbicides, combination fertilizer/pesticides, seed or equipment, call the toll free Scottline: 800/543-0006. (In Ohio, call collect: 513/644-2900.)



Scotts
ProTurf

A division of O.M. Scott & Sons, Marysville, Ohio 43040

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MSU gets \$30,000 grant for tree program

The Michigan Department of Natural Resources (DNR) has given Michigan State University researchers a \$30,000 grant for tree and forestland improvement throughout the state.

The annual renewable grant will aid MSU and the Michigan State Cooperative Tree Improvement Program (MICHCOTIP) in increasing forest productivity.

Dr. James Hanover, MSU forestry specialist and program coordinator, and researchers are trying to accomplish this through cultural and genetic improvements.

Part of the effort involves developing superior hybrids which mature more quickly than ordinary trees. To date, MSU has developed special varieties of fast growing spruce, poplar, aspen and birch. Seeds from their varieties are being

used to start plantations throughout Michigan.

The researchers are also testing cultural practices of fertilization, herbicide trials, spacing techniques and nursery production of hybrid varieties. These studies are conducted on cooperators' lands throughout Michigan to determine optimum growing conditions for certain species.

MICHOTIP was formed in 1974 as a cooperative effort to work on the problems of Michigan forestlands and urban trees. Members include MSU, DNR, universities and private companies from around the state. Members pay a yearly fee to participate in, and receive research benefits done through the program.

Part of the total research program is MSU's work on accelerated-optimal-growth *Accel-O-Gro

for rapid tree production. In Accel-O-Gro, trees are grown under greenhouse conditions, and through use of light and temperature controls growth is continuous and not affected by seasonal fluctuation. Trees can then be grown to the desired size much faster than regular nursery practices. Researchers can also determine more quickly the superiority of weaknesses of species grown under these conditions.

These techniques will be applied to all aspects of Michigan forestry — including street tree improvement and commercial and state forestland operation.

For more information about MICHCOTIP from Hanover write: Department of Forestry, Michigan State University, East Lansing, MI 48824. □

GOODALL

The Goodall Fillies

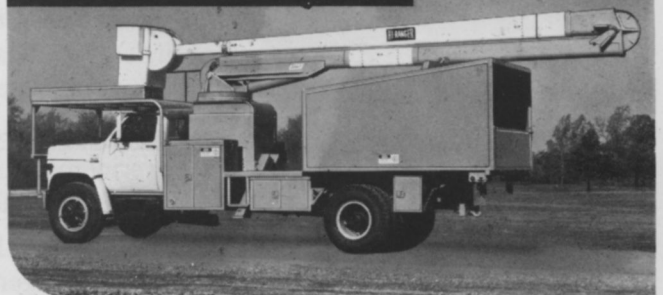


Introducing the 36 inch cut Goodall Rear Discharge mower. A new design deck allows close trimming on both sides, helps prevent windrows and gives you a clean manicured cut (not that just-cut look). The new variable speed drive gives a wider range of ground speeds. The 3 gallon fuel tank and Hi-Way front caster wheels are standard equipment. This new mower is designed for fine lawns and rough areas. The finger tip control gives the same easy handling and hillside stability and maneuverability as the other Goodall Self-Propelled models. Also available is a new 52 inch rear discharge mower.

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Phone 502/459-3811 Telex 204-340

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HI-RANGER Aerial Towers meet the "American National Standard for Vehicle-Mounted Elevating and Rotating Work Platforms ANSI A92.2-1969," as required by the Williams-Steiger Occupational Safety and Health Act of 1970, Part 1910, Occupational Safety and Health Standards: Section 1910.67; Part 1926, Safety and Health Regulations for Construction; Sections 1926.451 (f), 1926.556, 1926.952 (b), and 1926.955 (e), as applicable.

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Mix the perfect lawn with FYLKING.

This little Swedish beauty brought a new dimension to the turf grass industry. Fylking Kentucky bluegrass, with its greater density of rhizomes and root system, mixes with other fine lawn grasses to produce a lawn you'll always be proud of!

You'll never be plagued with annual bluegrass (*Poa annua*), bentgrass or short-awned foxtail when you plant Fylking. It is your guarantee of physically pure and genetically true seed.

Add the great beauty inherent to Fylking: brilliant green color in early spring, in summer heat, and into late fall; low-growing, fine-textured leaves that thrive mowed low as 1/2-inch; thick, luxuriant turf. Fylking is more resistant to disease, drought, heat, cold, smog, traffic and weed invasion.

Cost? Fylking seed costs less than most other elite bluegrasses.

A healthy, beautiful base for your lawn seed mix, ask for the Swedish beauty, Fylking Kentucky bluegrass.



FYLKING KENTUCKY BLUEGRASS

U.S. Plant Patent 2687

Another fine, quality-controlled product of Jacklin Seed Company.



Fylking's thick, brilliant-green, fine-textured, low-growing leaves and dense, tight-knit rhizomes and root system make superior turf.



Fylking plants are started from "original" breeder's seed in sterile green house media, then transplanted to fumigated soil in isolated breeders block for seed increase.



Pest Control

MARCH 1977 / ONE DOLLAR

WEED CONTROL...

Good Business for the Businesslike



Imminent patent expirations to impact \$1.6 billion pesticide market in Europe

About 115 British pesticide patents will expire during this year and the next, "and the expirations will open up new manufacturing possibilities," finds a study on the European market for insecticides, fungicides, herbicides, and other pesticides by market research specialists Frost & Sullivan, Inc. in New York City. Such patents include one held by BASF on a urea derivative herbicide, by Monsanto on a Quinazolines fungicide, by Bayer on a carbamic ester insecticide, by Geitelich Sohne on a thiourea derivative biocide, and by Lyonnaise Ind Pharmaceuticals on an Indandione derivative rodenticide.

This is but one finding in an unprecedented probe into the European pesticide market that, in 1975,

amounted to \$1.6 billion. Herbicides account for half of that figure, fungicides for about a quarter, and insecticides and miscellaneous pesticides for something less than 25 percent. By country, the largest national market is France at \$602 million a year, followed by West Germany at \$296 million, Italy at \$179 million, United Kingdom at \$165 million, and Spain at \$117 million.

Altogether the European Economic Community, that makes up the geographical market scope covered by the 212-page study, compares to the United States in agricultural self-sufficiency, especially in meats, dairy products, sugar, and cereals (except for maize). In addition, the EEC accounts for nearly

half the world's wine production. "Europe makes up a very large pesticide market," says the study, which also includes a chapter on the Russian market.

To meet that market need, some 1,000 companies turn out at least ten times that many pesticide formulations. By end-user category, forestry pesticides, in particular, offer "a scope for considerable expansion," while animal husbandry pesticides may decline in relative importance over the long term, the study says.

As for pest control, the industrial market is worth approximately \$50 million annually, with termite protection and other wood preservation measures accounting for half of the expenditures. An additional

Continued on page 40



100% Guarantee

If you don't agree that the Brandt Cap Cutter is the safest, easiest way to open plastic spouts, return immediately for full refund!

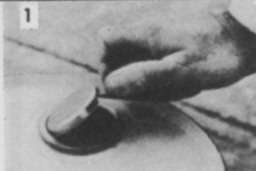
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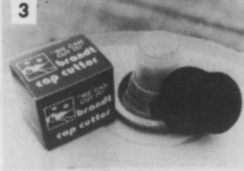


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Pull up the plastic spout and remove the drum cap.



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expirations affect european market

Continued from page 39

\$100 million market for pesticides in home and garden applications is growing at a 4 percent to 5 percent annual clip. This market is characterized by high-priced, high-margin products.

Government regulations present the biggest uncertainty to pesticide producers. "Regulatory schemes among the various countries are fundamentally similar, but maddeningly different in detail," the study says. A typical control requires a pesticide producer to show evidence that a new product is toxicologically and environmentally safe. Some countries also require a producer to prove the efficacy of a product. But virtually all countries either restrict or forbid the use of organo-chlorine insecticides and

arsenites, and they limit organic mercurial applications to seed dressings.

The hodgepodge of government controls has hurt new product development. Of the \$20 million that it costs to come up with a new pesticide, a manufacturer tends to spend about \$10 million on data gathering just to win government approval.

The EEC will eventually come to regulate pesticide use, so that a universal control scheme can prevail throughout Europe, the study forecasts. Such a scheme is likely to combine the wide scope of British regulations along with the provision in French, Belgium, and Norwegian schemes that require pesticides to be re-approved periodically.

"The resulting control could be superior to any one of the separate national schemes," the study observes.

Despite the government obstacles, some product innovation does go on. Synthetic pyrethrin-type insecticides will become commercially important within a few years, the study project. Another R&D trend is to develop herbicides that apply to a single crop. Also, more and more companies are turning out synergistic mixtures of traditional pesticide formulations. Looking further down the road, compounds that translocate downwards in a plant to do a job against soil-borne disease and pests will become "of great importance" in pesticide development. □

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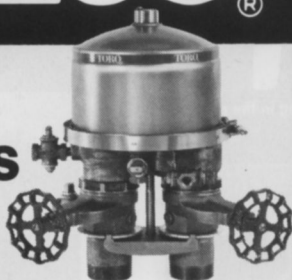
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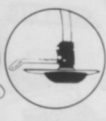
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\$500 research grants offered

The Horticultural Research Institute has announced the availability of \$500 Richard P. White Research grants for 1977. Any organization conducting research which may be of benefit to the nursery industry, including state and federal research laboratories, land grant universities, forest research stations, botanical gardens and arboreta, is invited to make application for one of the grants.

Recipients are selected on the basis of information provided on a simple questionnaire. Grant funds must be used for the purchase of supplies and materials for starting a project or enabling its completion. HRI would receive reports on progress and/or results of the work which would then be communi-

cated to the nursery industry. Applications must be submitted by May 1.

Grants will be announced at HRI's New Horizons research forum at the Annual Convention of the American Association of Nurserymen, July 16-20, Seattle, WA.

The grants are named after Dr. Richard P. White, instrumental in the founding of the Horticultural Research Institute, a non-profit institute devoted exclusively to the support and conduct of research necessary for the advancement of the nursery industry.

Grant applications are available by writing HRI at 230 Southern Building, Washington, D.C. 20005.



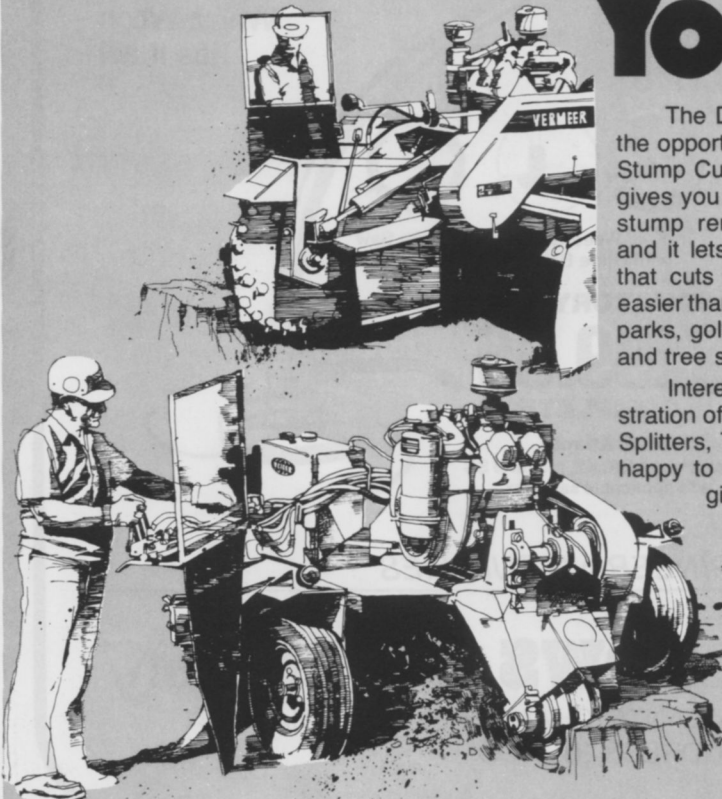
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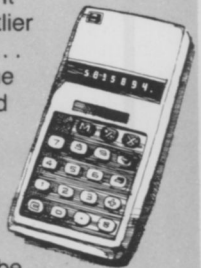
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Chemical firms may save 15% of energy used

The chemical industry will save enough energy to heat 10 million homes a year in 1980 alone, according to a business executive.

John R. Ryan, Hercules Inc. vice president, said the energy savings will be achieved in three years as a result of massive energy conservation projects now under way or planned by U.S. chemical firms. These savings will be the energy equivalent of 125 million barrels of oil each year.

Speaking at an energy-conservation luncheon, the Hercules spokesman noted the chemical industry “will achieve a 15 percent saving in energy use within three years.”

Ryan spoke after government leaders and news media representatives toured recently completed energy saving projects at a Plaquemine, La., methanol plant. The projects totaled more than a million dollars and are currently resulting in substantial energy savings.

The former Hercules plant is now owned by Hercofina, a joint venture between Hercules and American Petrofina, Inc.

The vice president said Hercules’ cumulative energy savings at 50 major plants would approach \$75 million over the next four years. He said several Hercules plants have already cut energy use by more than 20 percent.

“Soaring energy costs make conservation measures essential for industry,” said the vice president. “It’s also good business. Our projects show investment returns of at least 20 percent. Some have even resulted in more than 100 percent return.”

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What happens if that rear wheel leaves the ground on a downhill run? Nothing, if your mower's a HUSTLER.

The HUSTLER 272A steers with its drive wheels. Dual hydrostatic transmissions direct power to each wheel. Dual hand levers control those wheels, weight centered over them for traction and stability. Downhill, as the weight shifts forward, traction actually improves! You keep control. On rear-steer mowers, you lose it.

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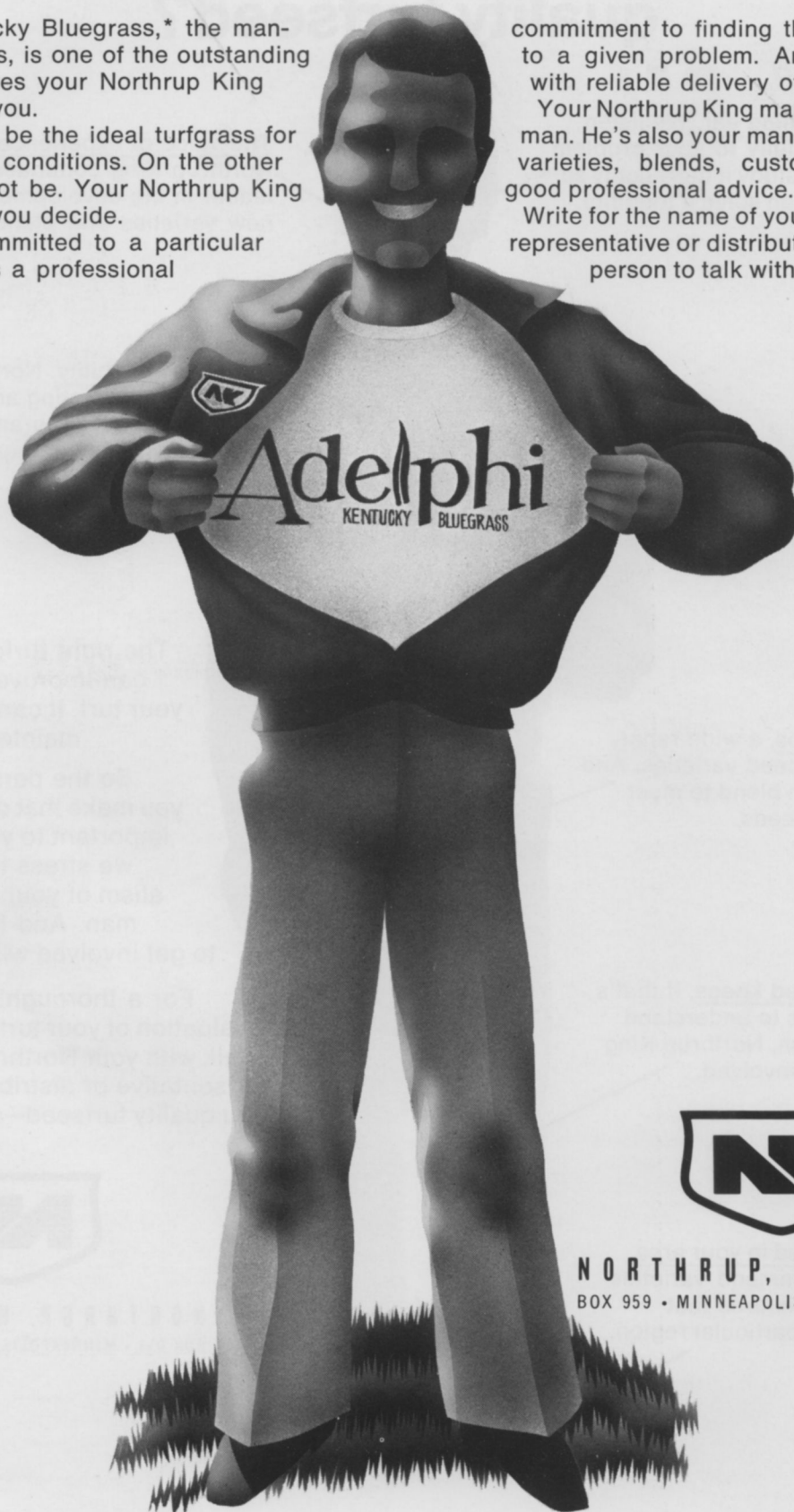
Adelphi may be the ideal turfgrass for your particular conditions. On the other hand, it may not be. Your Northrup King man can help you decide.

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Oregon Seed Assoc. gives scholarships

The Oregon Seed Trade Association presented cash scholarships totalling \$4,200 to Oregon State University students in December 1976 according to Robert Lowry, Association president.

Awards were made possible through the use of Association funds and individual donations by Association members. Students' names with their hometowns and the scholarships were as follows:

Richard Lawson, Klamath Falls, OSTA-Gordon Burlingham; Dick Yancey, Prineville, OSTA; Kenneth Iverson, Canby, OSTA-Continental Brokers; Drucilla Bass, Salem, OSTA-Lee Olsen; Ralph Fisher, Silverton, OSTA-Normarc, Inc.; Merri Woodell, Burns, OSTA-Normarc, Inc.; Vincent Obersinner, Mt. Angel, OSTA; Andy VanderPlaat, Corvallis, OSTA; Kerry Veal, Salem, OSTA; and Ron Myhrum, Silverton, OSTA.

Interviews were conducted by Dr. Jerry Pepin, Jim Smith, Alan Hick, Gerry Engle, and Russell Stark, members of the OSTA Scholarship Committee.

Stark says that academic standing is one of the criteria used in selection of recipients, but other factors, such as past experience, future plans, need, character, and personality are all considered. □

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1 TOTE non-poisonous weed killer for use where no growth whatsoever is wanted. Kills annuals, biennials, perennials on parking lots, drives, walks, gutters, courts. Finishes roots, stops seeds, sterilizes soil. 40 gallons of Tote in 60 or more of water cover a whole acre

4 LAKE DYE a safe, non-toxic blue water dye for lakes, ponds, water hazards. Colors to shade of blue you desire. Apply 2 pounds to the acre, 4 to 5 feet deep. Harmless to wild life—swans, ducks, geese, fish, frogs. Harmless to grass too. Compatible with fungicides, insecticides, turf chemicals.

2 E.W.T. selective weed-killer finishes broad-leaved weeds—kills dandelions, plantain, mouse-eared chickweed, even poison ivy—does not harm good grasses. Amine formulation: non-volatile; does not "jump" to flower beds or shrubbery.

5 DOLGE ANTI-DESSICANT protects turf grasses and broad leaved evergreens against drought and snow. Allows plants to breathe, yet prevents loss through water transpiration. Guards against summer scald and plant shock, too.

3 PENETRATE natural, organic soil improver. Works through compacted soil; lets air, water and nutrients go deeper. Promotes deeper, stronger root growth. Encourages vigorous, beautiful turf, shrubs, trees. Prevents soil erosion and puddling of surface water. Speeds germination of wanted vegetation.

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Meeting Dates

ALCA Student Field Day, Mississippi State University Campus, Starkville, MS, March 18-19.

Corrugated Plastic Tubing Association Annual Meeting, Innisbrook, Tarpon Springs, FL, March 20-23.

Institutional Garden Design Show, Pacific Design Center, Los Angeles, CA, March 25-28.

West Virginia Weed Control Association Annual Meeting, Holiday Inn No. 2, Charleston, WVA, March 29-30.

31st Annual Southeastern Turfgrass Conference, Rural Development Center, Tifton, GA, April 11-12.

Southern California Turf and Landscape Institute, Anaheim Convention Center, Anaheim, CA, April 20-21.

1977 Arizona Turfgrass Conference, Sunburst Hotel, Scottsdale, AZ, May 4.

International Society of Arboriculture Conference, Hilton Inn, San Diego, CA, May 20-23.

California Association of Nurserymen Annual Refresher Course, Cal Poly, San Luis Obispo, CA, June 1-3.

Oregon Seed Trade Association Annual Convention, Sunriver Lodge, Sun River, OR, June 10-12.

National Turf Management Clinic and Trade Show, O'Hare Inn, Chicago IL, July 25-26.

Home Horticulture Lawn Garden & Patio Exhibit, Expo Center, Chicago, IL, Oct. 14-17.

Highlight

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WORLD CHAMPION IN SUN OR SHADE

Judged World Champion at the 45th Annual Royal Agricultural Fair in Toronto, Canada, Highlight produces brilliant green turf and colonizes even in the dry root zone around trees.

A strong performer in winter and summer, Highlight may be cut to ¼ inch for specialized turf purposes. Blends beautifully with other grasses, shows excellent seedling vigor, requires less fertilizer and water and is unusually disease-resistant.



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for all
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Whether the job is to eliminate turf litter or industrial debris, the Big Wheel gets the job done quickly and thoroughly. Built for rugged use, the BT-70 works as easily on turf as it does on pavement. The 8 HP engine provides superior suction power and the BT-70 is agile enough to get it all.

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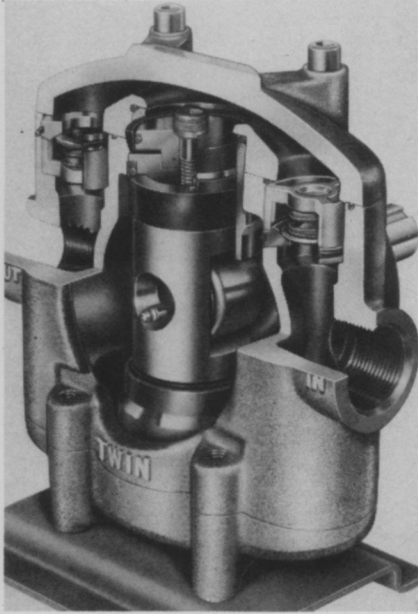
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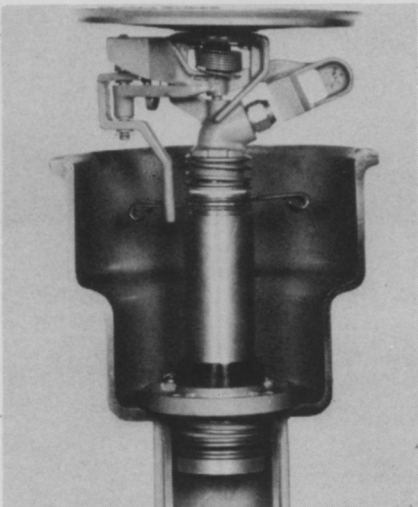


Products



HYPRO, a division of Lear Seigler Inc., announces a new twin-piston pump. The unit, called the Series 5900 Super-Twin, is designed to operate at working pressures to 500 PSI. at 600 RPM (the maximum speed). At 500 PSI, the unit pumps 18.5 GPM. The manufacturer recommends chain coupling drive with in-line shafts. The pump can also be belt driven.

Circle 701 on free information card

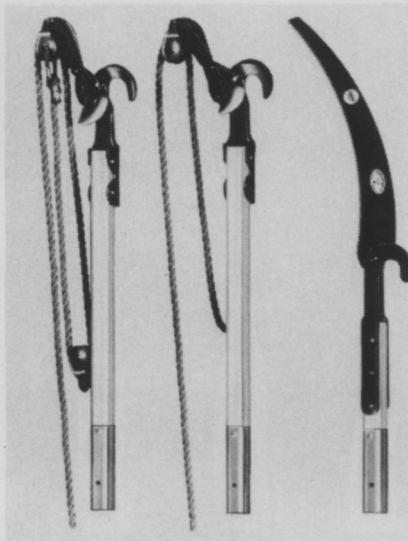


Royal Coach Sprinklers, Inc. announces production of three new,

one-inch female IPS, brass impact drive, rotary pop-up sprinklers with interchangeable nozzles for greater versatility and coverage.

The 10090 series sprinklers feature a one nozzle part circle model, a one nozzle full circle model, and a full circle model with two opposing nozzles. All three are equipped with an adjustable break-up nozzle and stream straighteners for greater distance and higher water pressure.

Circle 702 on free information card



Bartlett Manufacturing Co. is offering tree trimmer models with new drawn fiberglass handles. They will replace tree trimmers with laminated spruce handles which Bartlett has manufactured for many years. Both rectangular and round handles, with brass connecting sleeves, are available.

Section poles for extending reach up to 16 feet with rectangular models and up to 12 feet with round models are available. The extension poles can also be used with trimmer and with the wood handle units now in the field.

Circle 703 on free information card

The new Ross Super Tree Stake, a fast and easy method of delivering



nutrients to trees, evergreens, and all shrubs, is announced by Ross Daniels Inc. This new Tree Stake is of a compressed formula of 16 percent nitrogen 10 percent phosphorous and 9 percent potash, plus trace elements of iron and zinc.

These stakes lend themselves to rainy season use, feeding while the soil is soft. One application of this pre-measured time release stake will usually supply enough plant food to trees for one year, a great savings in time, fertilizer and money for users.

Circle 704 on free information card



Vemco Flail Mowers is expanding marketing of flail mowers for use on tractors up to 35 hp, with a category "O" or category "I" three point hitch and a rear P.T.O. shaft. They are available in cutting widths of 42", 48", and 60", and are capable

Continued on page 53

ONCE OVER PRECISELY

FORD 335



Here's rugged, economical power for landscaping, snow removal, mowing, materials handling and other work. 44 net SAE horsepower Ford diesel or gasoline engine. A wide range of options let you tailor the Ford 335 to meet your needs and your budget; transmission and PTO options, differential lock, 3-point hitch/hydraulics, 5/8-cubic yard loader, tire options, etc. Count on your Ford tractor and equipment dealer for sales and service. He's listed in the Yellow Pages under "Tractor Dealers". See him soon.

Fast, precise landscaping. Ford 3-point hitch and hydraulics (optional) with twin lever controls. Response is smooth and accurate with fine increments of adjustment.

Digging power. 10-foot Ford backhoe (optional) handy for ditching, digging transplanting sites, constructing irrigation lines. Rugged, fast-working backhoe.

FORD TRACTORS



Circle 105 on free information card

Products

Continued from page 51

of cutting grass, weeds and brush up to three feet high.

The basic design uses a horizontal rotating drum with a number of lightweight, free-swinging knives, and a wrap-around housing for protection.

Circle 705 on free information card

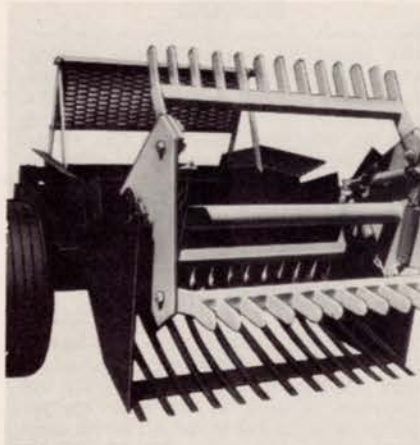


The **Toro Co.**, which entered the agricultural irrigation market two years ago with the acquisition of the Raincat center pivot system, has now introduced to that market the "Toro I," a highly versatile gear-driven sprinkler head.

The Toro I, with a basic body of tough Cicolac (ABS) which fits all standard agricultural irrigation systems, may be threaded directly to a riser without the need of coupling.

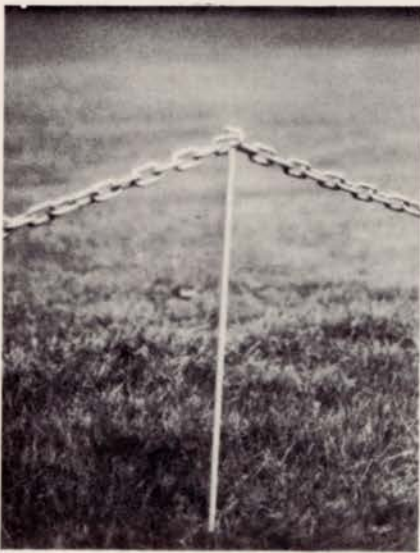
Circle 706 on free information card

Westgo Industries has introduced a Rotary Rock Picker that hauls nearly two tons of rock at one time. The rock picker handles rocks 2 1/2 to 24 inches in diameter, has a capacity rating of 3500 pounds, and is designed so the operator can control from the tractor seat. The bucket and 50-inch wide fork work in-



dependently with a rope trip and selector valve.

Circle 707 on free information card



Mercury Products has introduced a solid steel stake that costs no more than plastic stakes, and because of its durability, saves the additional costs of annual re-ordering. The Steel Stake is coated with a unique material that bonds itself to the steel and resists rust and scratches.

Circle 708 on free information card

Circle 106 on free information card

Ford power for grounds maintenance



See them now!

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When answering ads where box number only is given, please address as follows: Box number, c/o Weeds Trees and Turf, Dorothy Lowe, Box 6951, Cleveland, Ohio 44101.

Rates: All classifications 50¢ per word. Box number, \$1. All classified ads must be received by Publisher the 5th of the month preceding publication date and be accompanied by cash or money order covering full payment. Mail ad copy to: Dorothy Lowe, Weeds, Trees & Turf, P.O. Box 6951, Cleveland, Ohio 44101.

USED EQUIPMENT

FOR SALE: 2 used aerial baskets — 50 ft. working height, 2 Asplundh brush chippers. Bean sprayer, 35 G.P.M. Vermeer stump cutter 1560. Parkway Tree Service, Milwaukee, Wisconsin. Phone 414 257-1555.

FOR SALE: 1966 Ford F700 Skyworker with chipper box; 1971 Mitts and Merrill chipper 16" feed; F350 Ford with chip box and side tool boxes. John Mayer TreeCare. 707 459-2013.

SEVERAL 50 FOOT SERVI-lifts mounted on GMC trucks. Call 401 725-2250.

FOR SALE — 1975 Vermeer Ts-22" tree spade. Mounts on Bobcat or 3 pt. hitch. Excellent condition. \$1800.00. 1976 Care tree 30" tree spade. Mounts on Bobcat or 3 pt. hitch. Mint condition. \$2995.00. 1976 Care tree 36" tree spade. Mounts on 990 Bobcat, tractor, loader, or dozer. Mint condition. \$4495.00. 1972 Vermeer TS-44T tree spade on 1974 GMC 1 ton. New spades. Good condition. \$7800.00. Will send photographs upon request. Call or write: Spartan™ Tree Transplanting Equipment Company, 16084 S. Chandler Rd., East Lansing, Michigan 48823. Phone 517 351-1370. (We buy, sell, and repair high quality tree transplanting equipment).

1970 HIRANGER mounted on 1970 F-600 Ford truck with chip box and side tool boxes. Very good condition, \$22,500.00. 1974 HiRanger mounted on 1974 F-600 Ford truck with chip box and side tool boxes. Very good condition, \$28,500.00. Clearing Nicolas mulcher, can be attached to hydro-Ax or 3 point hitch on tractor, \$5,500.00. Osborne Tree Service, Mentor, Ohio 44060. 216 255-9109.

LANDSCAPE EQUIPMENT FOR SALE — 800 gallon Finn hydro-seeder, like new \$5,200.00; new 8' York rake, \$800.00; Gill pulverizer with seeder, \$700.00; Finn straw blower, \$1,500.00; 1968 Ford F-350 truck with 12' steel bed and new hoist, \$2,800.00; 10' lime or fertilizer spreader \$250.00. Lester's Landscaping, Fairborn, Ohio. 513 864-2138.

TS-66T VERMEER Tree Spade on 1973 GMC 6500 V-6. 2 speed rear end with positive traction — 5 speed transmission — 3700 actual miles. Better than a new machine. Call: 318 281-5596 days; 318 281-7849 nights.

FOR SALE Waynes Brush Chipper, 16 inch, less than 1000 hours, perfect shape. Klausung Tree Service, New Lenox, Illinois 60451. Phone 815 485-8488.

ROTOMIST BEAM TREE SPRAYER, model No. 100F-100. Skid mount. 100 gallon tank, used very little. Good running condition. \$4,200.00. Call 203 537-2933.

VERMEER TS44T on 1969 Chev. C50, ready to work, pictures and price on request. 208 664-5914. 821 4th St., Coeur d'Alene, Idaho 83814.

HYDRO-AXS FOR SALE. Price range \$22-\$30,000. Excellent condition. Call Jeff Gould, 203 767-1636, P.O. Box 178, Essex, Conn. 06426.

FOR SALE: 7 gang Roseman Mower \$1350. Foulkes Sod Farm 414 484-3941.

1974 VERMEER TS-44A. Excellent condition, moved only 200 trees. 317 665-3851.

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SOD QUALITY Seeds Merion, Fyking, Delta, Park, Newport, Nugget, Adelphi, Cheri, Glade and Baron bluegrasses also fine fescues. Manhattan rye grass. Custom mixing available. Michigan State Seed Co., Grand Ledge, Michigan 48837. Phone 517 627-2164.

SEEDS, TROPICAL. Bulk orders. Call SS 305 278-6004, One Southeast 4th Ave., Suite 208, Delray Beach, Fla. 33444.

HELP WANTED

YEAR ROUND WORK A.A.A. Tree Service, Inc. of Florida. Looking for experienced top notch climbers with or without truck and equipment to work by the hour, on percentage or under Franchise in Florida areas. Also needed older men with sales ability. Mechanic with chain saw experience. Man to operate his own tree spade. Henry Hardy, Jr., P.O. Box 6173, Orlando, Fla. 32803. Phone 305 339-5242.

PARK SUPERINTENDENT The City of West Bend is accepting applications for a Park Superintendent who will be responsible for the maintenance of all City parks, recreation facilities, parkways, boulevards, nursery, and City forestry. Candidates must have had supervisory experience in these areas with a degree based on Park Administration or a related field such as horticulture, forestry, or conservation. Starting salary will be \$1,166.00 to \$1,291.00 per month — depending on qualifications. Liberal fringe benefits provided. Applications will be accepted until position is filled. Send resume to Personnel Director, City Hall, 100 N. Sixth Ave., West Bend, Wis. 53095.

INSTRUCTOR/ASSISTANT PROFESSOR PLANT SCIENCE: Teach horticultural courses such as Nursery Operations, Landscape Construction, Turf Management and Plant Identification and Utilization. Possibility of evening and summer teaching.

Assist in arranging summer work experience for students. Qualifications: Master Degree in Plant Science with strong leaning toward practical applications. 5 years of commercial or other field experience in plant science. Characteristics: mature, conscientious, imaginative, creative & demonstrated leadership potential. Application deadline, 4/15/77, position begins 9/1/77. Contact Dr. Lewis Roberts, Jr., Thompson School of Applied Science, Barton Hall, University of New Hampshire, Durham, N.H. 03824. The University is an Affirmative Action/Equal Opportunity Employer.

ASSISTANT SUPERINTENDENT or Grounds Foreman, attractive memorial gardens located in North Midwest has an excellent opportunity for an experienced assistant superintendent or a grounds foreman. Applicant should have a minimum of five years cemetery experience and at least two years in a supervisory position. All inquiries strictly confidential. Please send resume to Box 160, Weeds, Trees & Turf, Box 6951, Cleveland, Ohio 44101.

PERSONS WITH HORTICULTURAL, entomology and agronomy backgrounds or related practical experience to fill position as management trainees to learn the mechanics of our lawn spraying and general household pest control business for our branch office in Maine. Send resume (held in confidence) to Collins Insect Control, Inc., B.D. Collins, Pres., P.O. Box 998, Boca Raton, Fla. 33432.

LANDSCAPE-DESIGNER/SALESMAN. Landscaping Nursery specializing residential-commercial projects has permanent position available for person with experience, ambition and reliability. Must have plant knowledge and good design ability with positive sales technique. Immediate opening. Send resume to Francisco Tavares, Inc., P.O. Box 231, East Falmouth, Mass. 02536. Phone 548-0911.

INDIVIDUAL WITH EXPERIENCE in utility right-of-way tree and brush work. Middle management position to supervise spraying, trimming and clearing crews. Must be willing to travel. Call or write Chem-Trol, Inc., P.O. Box 2343, Kansas City, Kansas 66110. 913 342-3006.

SOD

TISCHLER ZOYSIA GRASS FARM, 4206 Medical Parkway, Austin, Texas 78756.

NOTICE OF CHANGE IN RATES

Effective June 1, 1977, classified advertising in WEEDS TREES & TURF magazine will be 65¢ per word.

NEW DEADLINES & PUBLISHING DATES

Effective with January, 1977 issue our classified pages will close and issues will mail on the following schedule:

Orders and copy are due 5th of month preceding issue date.
Publication mailed the 27th of each month.

As in the past, our policy is cash or money order covering full payment with order.

We're pleased to have served you in the past and look forward to being of service to you again in the future.

FOR SALE

SEWAGE TREATMENT PLANT — two 11,000 gallon units in series. Can be used singly. Plant was operating until municipal system was employed. Bargain price of \$12,000.00 or will trade for used mobile homes or "what have you". Mayo Mobile Homes, Trexlertown, Penna. 18087.

BUSINESS OPPORTUNITIES

EXCLUSIVE FRANCHISE AVAILABLE to the right person. Requirements — 100 to 300 acres of good farm land. One or two people willing to learn and work. Payoff — a competitive advantage in the growing lawn grass sod market. We know the business and are looking for winners only! Beck Mfg. Co., P.O. Box 2014, Auburn, Alabama 36830.

When answering ads where box number only is given, please address as follows: Box number, c/o Weeds Trees and Turf, Dorothy Lowe, Box 6951, Cleveland, Ohio 44101.

Rates: All classifications 50¢ per word. Box number, \$1. All classified ads must be received by Publisher the 5th of the month preceding publication date and be accompanied by cash or money order covering full payment. Mail ad copy to: Dorothy Lowe, Weeds, Trees & Turf, P.O. Box 6951, Cleveland, Ohio 44101.

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For **FASTEST** service attach old mailing label in space below.

If mailing label is not available, print your old company name and address in this box.

Please allow 6 weeks for change to take effect.

Print your correct name, title, business address, and/or other corrections.

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WEEDS, TREES & TURF
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There is one sure way to keep a consistent moisture level on your tees, fairways and greens.

Install a **PURR-Wick** water management system using . . .

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CROSS-LAMINATED POLY SHEETING

By building your tees, fairways and greens over Tu-Tuf barrier liners, you will have total control of the moisture content. Water will be contained during dry weather and will soak through and be drained out during heavy storms.


You will save water, fertilizer, labor and cut maintenance costs significantly. Construction costs are about 1/2 that of traditional designs.

Why is Tu-Tuf so important?

Tu-Tuf is cross laminated adding strength, flexibility and durability over standard poly sheeting.

Tu-Tuf . . .

- has up to 10 times the water-vapor transmission rate
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To correct your dry or wet condition write or call for free brochure and construction guidelines for PURR-Wick water management systems with Tu-Tuf.

Ask us about our superior sand trap liner.

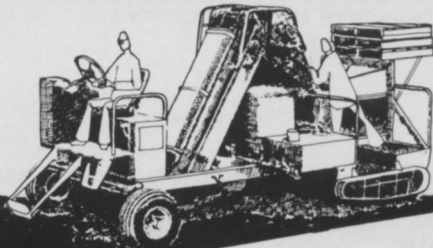
Meet the "Untearable" Mr. Tu-Tuf

STO-COTE PRODUCTS, INC.

Richmond, Illinois 60071 • Call Toll Free 800/435-2621 • In Illinois 815/675-2358

Circle 141 on free information card

Our Customers Insist
**Princeton's "Self-Propelled"
 Sod Harvester is Unbeatable!**



**Richard P. Jenks, President
 REDETURF, INC.
 Hubbard, Oregon**

"Redeturf personnel have experience with all commercially available sod harvesters and we feel the Princeton method is the best. We have used the Princeton "Self-Propelled" since 1968 and have cut our labor force enough to pay for several machines."

**David W. Picha, General Manager
 EMERALD TURF GRASS FARMS
 Sumner, Washington**

"We harvested over 20 million square feet of sod with a Princeton "Self-Propelled" before the first overhaul."

**Stanley F. Cruse, Vice Pres./General Manager
 PURSLEY TURF GRASS
 Palmetto, Florida**

"Harvesting quality turf grass requires quality equipment. That's why we use Princeton."

Our customers say it best. Increase your profits...by reducing costs and increasing production. Three man crew can harvest 22,500 sq. ft. of sod per hour with Princeton's "Self-Propelled" Sod Harvester.

There's a Princeton for Everyone.



Designed to meet the special needs of the smaller volume sod producer. Operates behind any adequately sized, low speed tractor. Exclusive "2 minute hook-up" capability allows complete flexibility in the use of your power supply. With a 3-man crew, harvest up to 13,500 sq. ft. of sod per hour...palletized, ready to ship. The "Tow Boy" Sod Harvester...a real Princeton at one third the cost of our larger machines.

The only sod harvester that does it all...with just one man! Cuts, aerates, crosstie stacks, and palletizes 27,000 sq. ft. of sod per hour with a crew of one. Save time, money, and man hours. For the large volume sod producer who wants to increase production and profit. The Princeton "Automatic" Sod Harvester.



**Chuck Braun
 Sales Manager
 955 W. Walnut Street
 Canal Winchester, Ohio 43110
 (614) 837-9096**

For additional information write or call collect:

PRINCETON
 MANUFACTURING COMPANY

Circle 142 on free information card

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The Jacobsen 70" Triplex trims close like a hand mower, mows fast like a riding mower.

Here's the most maneuverable and versatile little riding mower you've ever laid eyes on. Small but powerful. It's driven by a full 8 HP engine.

Without leaving the seat you can trim close around trees and under low-hanging shrubs and tree branches. And cut a hefty 70" swath at the same time.



Reels come equipped with either skids or rollers. Large capacity catchers are optional.

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Here's another Jacobsen exclusive. The reel speed is independent of the mowing speed. Which lets you put a beautiful crew cut finish on any turf.

Want to change cutting height? Easy. All you need is a wrench.

And, the 70" Triplex Trimmer is the only mower of its type to

meet the American National Standards Institute, Inc. (ANSI) safety standards.



The mowers are fully articulated so they hug the contours of uneven ground.

Ask your Jacobsen Distributor for a demonstration of the biggest little riding mower on wheels.

Take a look at leadership.

Jacobsen Manufacturing Company, Racine, Wisconsin 53403

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An Allegheny Ludlum Industries Company

“One crew grows our sod, another crew lays it at the customer’s home or place of business. . . Both crews have their own reasons for preferring

baron* Kentucky Bluegrass.”

John Hoerr of D. A. Hoerr & Sons, Peoria, Illinois.

D. A. Hoerr and Sons, Peoria, Ill., raises 500 acres of sod and lays much of it through their Landscape Contractual Division at commercial, industrial, municipal and homeowner sites. James Hoerr says: “Since we began using Baron Kentucky Bluegrass, we’ve had less problems raising a good quality sod

and even fewer problems after the sod is laid. We can’t just sell sod and hope for the best. We’re responsible, even after installation. We find it pays to start with the very best seed we can buy. Baron gives us a well knit sod that takes root quickly, cutting down on service calls”.



“When it comes to marketing sod, I can do it faster with Baron. John Hoerr says, “Baron’s fast germination and quick development into mature sod shortens the time between planting and the day I sell my sod. In the sod growing business, that means money in our pockets.”



“We use a blend of 3 blue-grasses with a minimum of 50% being Baron Kentucky Bluegrass. The other two varieties are Majestic and Merion. The high percentage of Baron insures us of what we consider to be our safety factor.”



“Since we have been putting Baron in our mixture, we find the overall color holds up with less fertility. I use less fertilizer with Baron in the mixture than I have with any other blue-grass mixtures.”

“All of our sod is mechanically harvested so it’s important that root development is rapid and our sod holds together well. Baron lets us keep our fields clipped close and roots seem to knit well, giving us less hauling and handling problems. In our Landscape Contract and Maintenance Contract Servicing Departments, we know in advance complaints from the end user will be minimal.”

If you’re a sod grower, golf superintendent, or a professional landscape contractor, top quality turf is important to you. Lofts is ready to help with Baron, Majestic or Touchdown Kentucky Bluegrasses, Jamestown Chewings Fescue, Yorktown and Diplomat Ryegrasses as well as other varieties.



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* U.S. Plant Patent #3186, Dwarf Variety

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