From a Bird's Eye View

PENNCROSS
CREEPING BENTGRASS

Looks Greater, Putts Straighter

The putting grass superintendents prefer. Easy to establish, lower maintenance costs.

Elkhorn Valley Golf Course
Mehama, Oregon
...the tough one, for total vegetation control!

- Less pounds last longer!
- Gets most tough weeds and most brush others leave behind!
- Gets most tenacious vines, brambles and woody plants!
- Is remarkably resistant to leaching and lateral movement!

Acceptability!

For the past several years, SPIKE has been tested in actual field situations with commercial equipment. When applied in accordance with label directions, SPIKE will result in a high level of long lasting total vegetation control.

Test plot demonstrates dramatic result of single application of SPIKE.

Durability!

Commercial field use has demonstrated that at recommended application rates SPIKE remains effective longer than most other products tested, and permits lower application rates in succeeding years. Long-term control prevents regrowth for extended periods of time.

Missouri test plot treated with SPIKE shows residual control 2 years later!
Capability!

Five years of development and more than three years of extensive nationwide on-site testing in non-crop areas have proven SPIKE highly effective in the control of a wide spectrum of vegetation, including many of the so-called hard-to-control species. SPIKE effectively controls many tough perennials, as well as many woody brush and vine-type species that escape other control products.

Dead common mullein along right-of-way is a dramatic example of SPIKE’s effectiveness on tough-to-control species.

Commercially-applied test plot demonstrates SPIKE’s ability to eliminate persistent varieties such as Bouncing Bet.

Suitability!

Because of SPIKE’s features
- Less pounds last longer
- Gets most tough to control weeds and brush
- Gets most tenacious woody vines and brambles
- Is remarkably resistant to leaching and lateral movement

SPIKE belongs in your total vegetation program.

“Before” and “after” views of the same test plot clearly demonstrate SPIKE’s ability to control brush and woody vegetation.

Dependability!

... that’s what all of SPIKE’S abilities add up to. SPIKE is a proven total vegetation control product that is truly tough on weeds! What’s your tough vegetation control problem? Whatever it is, consider SPIKE an essential weapon in your chemical arsenal. Contact your ELANCO distributor for full details on SPIKE ... the tough one for total vegetation control!

SPIKE is a registered trademark for Elanco Products Tebuthiuron

Elanco Products Company, A Division of Eli Lilly and Company, Dept. E-455, Indianapolis, Indiana 46206 U.S.A.
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 (CaCO₃). 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 ½ the recommended rate.

(3) Hydrated or slaked lime is calcium hydroxide (CaOH₂) and is about 1 ½ 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.
## Relative Neutralizing Values of Liming Materials

<table>
<thead>
<tr>
<th>Liming Material</th>
<th>Chemical Formula</th>
<th>Relative Neutralizing Value, %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Magnesium oxide</td>
<td>MgO</td>
<td>250</td>
</tr>
<tr>
<td>Calcium oxide</td>
<td>CaO</td>
<td>178</td>
</tr>
<tr>
<td>Magnesium hydroxide</td>
<td>Mg(OH)₂</td>
<td>172</td>
</tr>
<tr>
<td>Calcium hydroxide</td>
<td>Ca(OH)₂</td>
<td>135</td>
</tr>
<tr>
<td>Magnesium carbonate</td>
<td>MgCO₃</td>
<td>119</td>
</tr>
<tr>
<td>Calcium carbonate</td>
<td>CaCO₃</td>
<td>100</td>
</tr>
</tbody>
</table>

for plant growth and development. Calcium ions also help aggrandize 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.

---

**Our new sprinkler system is priced to be right at home in your neighborhood.**

Our new residential system is economically priced to keep your landscape bids very competitive. Without sacrificing the high performance you expect from Rain Bird.

Specify a home sprinkler system that includes our quality components - economical RC7 automatic controller; EV100 control valve; 15111 pop-A-Way* sprinkler, or 1800 pop-up spray head. Each is expertly built for economical, reliable installations.

When you're looking for a residential system in an affordable neighborhood, move right in with Rain Bird. Contact your local Rain Bird distributor for more details.
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**

<table>
<thead>
<tr>
<th>Categories</th>
<th>Percent Increase 1975-85</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power Lawn Mowers</td>
<td>154%</td>
</tr>
<tr>
<td>Other Big Power Tools</td>
<td>164%</td>
</tr>
<tr>
<td>Hand Power Tools</td>
<td>249%</td>
</tr>
<tr>
<td>Non-Power Garden Tools</td>
<td>181%</td>
</tr>
</tbody>
</table>

**GROWING PRODUCTS AND SUPPLIES SALES**

<table>
<thead>
<tr>
<th>Categories</th>
<th>Percent Increase 1975-85</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fertilizers</td>
<td>88%</td>
</tr>
<tr>
<td>Pesticides</td>
<td>59%</td>
</tr>
<tr>
<td>Soil Conditioners</td>
<td>82%</td>
</tr>
<tr>
<td>Grass Seed</td>
<td>N/A</td>
</tr>
<tr>
<td>Growing Products</td>
<td>156%</td>
</tr>
</tbody>
</table>

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.
Cut Out Weed Cutting
For one or more years*

OXY® UREABOR
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.

- Kills perennials and annuals in one application.
- Long-lasting control of seedlings and regrowth.
- 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.)

<table>
<thead>
<tr>
<th>Product</th>
<th>Movement in Soil</th>
<th>Control of Annuals</th>
<th>Comparative Longevity</th>
<th>Comparative Product Feature</th>
</tr>
</thead>
<tbody>
<tr>
<td>Monobor-Chlorate</td>
<td>Low</td>
<td>Excellent</td>
<td>Good</td>
<td>Most economical</td>
</tr>
<tr>
<td>Monobor-Chlorate + Duron (Weed and Grass Killer)</td>
<td>Low</td>
<td>Excellent</td>
<td>Good</td>
<td>Excellent under asphalt paving</td>
</tr>
<tr>
<td>Ureabor</td>
<td>High</td>
<td>Excellent</td>
<td>Excellent</td>
<td>Economical, double action, for sus-</td>
</tr>
<tr>
<td>Borocil IV</td>
<td>High</td>
<td>Excellent</td>
<td>Excellent</td>
<td>tained annual weed control.</td>
</tr>
<tr>
<td>Hibor C</td>
<td>High</td>
<td>Excellent</td>
<td>Excellent</td>
<td>Strong control of deep-rooted peren-</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>nial weeds</td>
</tr>
</tbody>
</table>

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

Please contact me about Oxy’s non-crop, non-selective herbicides.

Name ____________________________
Address ____________________________
City ____________________________ State ______ Zip __________
Phone ____________________________

Return to: Occidental Chemical Company
P. O. Box 1183
Houston, Tx. 77001
Attn: Herbicide Products Mgr.
Suite 606

Circle 137 on free information card
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.


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.

CUSHMAN
RYAN

OMC-Lincoln, a Division of Outboard Marine Corporation, 7707 Cushman Drive, P.O. Box 82409, Lincoln, NB 68501
LAWN CARE INDUSTRY
A SUPPLEMENT TO WEEDS, TREES & TURF
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.

Month after month, IBDU and PAR EX fertilizers release just enough nutrients to keep turf and ornamentals green and hardy. IBDU, unlike all other slow release nitrogens, is activated by soil moisture, not soil bacteria. It releases at an even, steady rate that can’t be hurried or slowed by extremes in temperature. Precision mixed with other nutrients, gives you the best balanced fertilizer available today.

Start your customers out with a nutrition program that includes IBDU and PAR EX fertilizers. Your customers will like the results. And you’ll like the added green. Contact your PAR EX distributor or call us, 312/431-2509.
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
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.

The insects: Lawn chinch bugs, Ants, Armyworms, Clover mites, Springtails (Collembola), Crickets,
turf insects than turf insecticide.

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, Rhodesgrass scales.

If you'd like to have a copy of the Diazinon label, pick up one from your local supplier.

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

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 antecedors 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


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

<table>
<thead>
<tr>
<th>Services</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fertilization</td>
<td>100.0</td>
</tr>
<tr>
<td>Liquid</td>
<td>6.4</td>
</tr>
<tr>
<td>Dry</td>
<td>57.7</td>
</tr>
<tr>
<td>Both</td>
<td>35.9</td>
</tr>
<tr>
<td>Pre-emergence crabgrass and foxtail control</td>
<td>78.8</td>
</tr>
<tr>
<td>Weed control</td>
<td>86.2</td>
</tr>
<tr>
<td>Chinch bug control</td>
<td>67.0</td>
</tr>
<tr>
<td>Fungus control</td>
<td>65.5</td>
</tr>
<tr>
<td>Sod webworm control</td>
<td>68.9</td>
</tr>
<tr>
<td>Grub proofing</td>
<td>55.2</td>
</tr>
<tr>
<td>Bill bug control</td>
<td>31.5</td>
</tr>
<tr>
<td>Aphid control</td>
<td>43.4</td>
</tr>
<tr>
<td>Soil testing</td>
<td>48.3</td>
</tr>
<tr>
<td>Liming</td>
<td>58.6</td>
</tr>
<tr>
<td>Soil conditioning — calcium and magnesium carbonate</td>
<td>40.9</td>
</tr>
<tr>
<td>Tree feeding</td>
<td>51.2</td>
</tr>
<tr>
<td>Spikes</td>
<td>23.6</td>
</tr>
<tr>
<td>Tablets</td>
<td>6.9</td>
</tr>
<tr>
<td>Dry fertilizer</td>
<td>41.9</td>
</tr>
</tbody>
</table>
WHAT IS YOUR ANTICIPATED INCREASE IN BUSINESS IN 1976 OVER 1975?

Increase in Business

<table>
<thead>
<tr>
<th>Increase in Business</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>+100% or more</td>
<td>4.8%</td>
</tr>
<tr>
<td>+50% to +99%</td>
<td>3.6%</td>
</tr>
<tr>
<td>+40%</td>
<td>1.8%</td>
</tr>
<tr>
<td>+35%</td>
<td>8.3%</td>
</tr>
<tr>
<td>+30%</td>
<td>8.9%</td>
</tr>
<tr>
<td>+25%</td>
<td>13.1%</td>
</tr>
<tr>
<td>+20%</td>
<td>23.8%</td>
</tr>
<tr>
<td>+10%</td>
<td>20.8%</td>
</tr>
<tr>
<td>+5%</td>
<td>14.9%</td>
</tr>
</tbody>
</table>

Chemical Purchases

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

<table>
<thead>
<tr>
<th>Percentage Of Chemical Purchases</th>
<th>Percent Responding</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fertilizer</td>
<td></td>
</tr>
<tr>
<td>Less than 10 percent</td>
<td>1.2</td>
</tr>
<tr>
<td>10 - 24</td>
<td>9.5</td>
</tr>
<tr>
<td>25 - 49</td>
<td>16.0</td>
</tr>
<tr>
<td>50 - 74</td>
<td>46.0</td>
</tr>
<tr>
<td>75 - 99</td>
<td>23.7</td>
</tr>
<tr>
<td>100 percent</td>
<td>3.6</td>
</tr>
<tr>
<td>Herbicides</td>
<td></td>
</tr>
<tr>
<td>Less than 10 percent</td>
<td>14.4</td>
</tr>
<tr>
<td>10 - 24</td>
<td>56.9</td>
</tr>
<tr>
<td>25 - 49</td>
<td>20.3</td>
</tr>
<tr>
<td>50 - 74</td>
<td>7.2</td>
</tr>
<tr>
<td>75 - 99</td>
<td>—</td>
</tr>
<tr>
<td>100 percent</td>
<td>1.2</td>
</tr>
<tr>
<td>Insecticides</td>
<td></td>
</tr>
<tr>
<td>Less than 10 percent</td>
<td>19.1</td>
</tr>
<tr>
<td>10 - 24</td>
<td>56.1</td>
</tr>
<tr>
<td>25 - 49</td>
<td>13.4</td>
</tr>
<tr>
<td>50 - 74</td>
<td>6.4</td>
</tr>
<tr>
<td>75 - 99</td>
<td>3.2</td>
</tr>
<tr>
<td>100 percent</td>
<td>1.8</td>
</tr>
<tr>
<td>Fungicides</td>
<td></td>
</tr>
<tr>
<td>Less than 10 percent</td>
<td>47.2</td>
</tr>
<tr>
<td>10 - 24</td>
<td>44.8</td>
</tr>
<tr>
<td>25 - 49</td>
<td>4.8</td>
</tr>
<tr>
<td>50 - 74</td>
<td>1.6</td>
</tr>
<tr>
<td>75 - 99</td>
<td>—</td>
</tr>
<tr>
<td>100 percent</td>
<td>1.6</td>
</tr>
<tr>
<td>Other</td>
<td></td>
</tr>
<tr>
<td>Less than 10 percent</td>
<td>44.4</td>
</tr>
<tr>
<td>10 - 24</td>
<td>28.9</td>
</tr>
<tr>
<td>25 - 49</td>
<td>20.0</td>
</tr>
<tr>
<td>50 - 74</td>
<td>—</td>
</tr>
<tr>
<td>75 - 99</td>
<td>—</td>
</tr>
<tr>
<td>100 percent</td>
<td>6.7</td>
</tr>
</tbody>
</table>
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 con-
iferous. No vapor action after applica-
tion. Effective in temperatures of 50°
or lower. Sequestered to overcome water hardness problems. Areas may be seeded within two
weeks. Non-flammable and non-
corrosive in use. Biodegradable.

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 visi-
ble residue. Use it with Exhalt® 800 Sticker-Extender to prolong its effec-
tiveness.

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 ex-
tended protection.

BETAMEC-4™, the premier pre-
emergence grass killer for use on es-
tablished turf, ornamentals and
ground covers. Controls crabgrass,
Poa annua, grassy weeds and certain

AUTHORIZED DISTRIBUTORS

ALASKA
Foster • Alaska, Inc.

ARKANSAS
• Foster Equipment Co.

CALIFORNIA
Arcadia • Eagle Chemical Co.

COLORADO
Arvada • S.A.I., TRIP Products

CONNECTICUT
Greenwich • General Sheinin Greenhouses & Nur.

IDAHO
Boise • Dave Regan Co.

ILLINOIS
Bloomington • Professional Turf Specialties

KANSAS
Kansas City • Biological Turf Service

KENTUCKY
Lancaster • A. C. Reynolds Co.

LOUISIANA
Baton Rouge • Turf Supply Co.

MARYLAND
Annapolis • Eagle Chemical Co.

MASSACHUSETTS
Cambridge • John 0 Lyons

MICHIGAN
Birmingham • W. F. Miller Co.

MICHIGAN
Birmingham • W. F. Miller Co.

MICHIGAN
Birmingham • W. F. Miller Co.

MARYLAND
Annapolis • Eagle Chemical Co.

MASSACHUSETTS
Cambridge • John 0 Lyons

MICHIGAN
Birmingham • W. F. Miller Co.

MICHIGAN
Birmingham • W. F. Miller Co.

MARYLAND
Annapolis • Eagle Chemical Co.

MASSACHUSETTS
Cambridge • John 0 Lyons

MICHIGAN
Birmingham • W. F. Miller Co.

MICHIGAN
Birmingham • W. F. Miller Co.

MARYLAND
Annapolis • Eagle Chemical Co.

MASSACHUSETTS
Cambridge • John 0 Lyons

MICHIGAN
Birmingham • W. F. Miller Co.
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 Turf Herbicide is sometimes indicated for general weed control on roughs, roadsides, outbuildings, etc. A simplified label specifically for turf application.


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.


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.

Your TRIMEC distributor is just that. A veritable fountainhead of products and skills; virtually everything you need for better turf management.

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. All well supported by the professionalism of your Turfman 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.

Your TRIMEC distributor. He’s a silent partner you can count on, any day you need help.

GORDON PROFESSIONAL TURF PRODUCTS
mushrooming business
Continued from page H

DOLLAR VOLUME OF BUSINESS?

<table>
<thead>
<tr>
<th>Dollar Range</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>$500,000 or more</td>
<td>7.6%</td>
</tr>
<tr>
<td>$100,000 - $499,000</td>
<td>25.8%</td>
</tr>
<tr>
<td>$50,000 - $99,000</td>
<td>23.5%</td>
</tr>
<tr>
<td>$25,000 - $49,000</td>
<td>21.2%</td>
</tr>
<tr>
<td>$10,000 - $24,000</td>
<td>12.9%</td>
</tr>
<tr>
<td>$9,000 or less</td>
<td>9.0%</td>
</tr>
</tbody>
</table>

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-

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?

<table>
<thead>
<tr>
<th>Month</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>January</td>
<td>20.4</td>
</tr>
<tr>
<td>February</td>
<td>41.9</td>
</tr>
<tr>
<td>March</td>
<td>57.0</td>
</tr>
<tr>
<td>April</td>
<td>47.3</td>
</tr>
<tr>
<td>May</td>
<td>45.7</td>
</tr>
<tr>
<td>June</td>
<td>40.9</td>
</tr>
<tr>
<td>July</td>
<td>29.0</td>
</tr>
<tr>
<td>August</td>
<td>34.4</td>
</tr>
<tr>
<td>September</td>
<td>26.4</td>
</tr>
<tr>
<td>October</td>
<td>12.9</td>
</tr>
<tr>
<td>November</td>
<td>6.4</td>
</tr>
<tr>
<td>December</td>
<td>6.4</td>
</tr>
</tbody>
</table>
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.
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?

<table>
<thead>
<tr>
<th>Method</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>TV</td>
<td>9.0%</td>
</tr>
<tr>
<td>Radio</td>
<td>20.9%</td>
</tr>
<tr>
<td>Door to Door</td>
<td>26.8%</td>
</tr>
<tr>
<td>Direct Mail</td>
<td>39.6%</td>
</tr>
<tr>
<td>Newspaper</td>
<td>76.9%</td>
</tr>
<tr>
<td>Other</td>
<td>21.6%</td>
</tr>
</tbody>
</table>
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.
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 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...
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.
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 standards 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.

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 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.

Always read and carefully follow the Roundup label directions. R1 2/7

Circle 155 on free information card
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
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, Dichroima and zoysiagrass. Can be used on new seedings 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.

The resourceful company.
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.

The major advantage of the liquid application program 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 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
methods of controlled delivery.

Powder Blue, a powdered urea formaldehyde 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 incorporated 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.
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 ¾ 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
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

Balan’s new granular form makes it even easier to apply.
We finally found a way to improve Balan...

...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.

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 Pembrook 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
2778 Jo Beth Drive, Lawrenceville, GA 30245

**Midwest**—S. H. Springer
P. O. Box 56279, 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

Or write Dept. E455 Elanco Products Company • A Division of Eli Lilly and Company • Indianapolis, Indiana 46206 U.S.A.
We were making equipment modifications and upgrading our professionalism

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-
Cut the cost of expensive horsepower and expensive manpower.

Bolens® HT-20 Tractor.
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, backhoe, 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.

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

Circle 112 on free information card
In 1972 we started to franchise the entire operation, offering a full-service company.

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 services 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 sprayman 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.
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.
### Herbicide and Broadleaf Weed Susceptibility

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

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
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.
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.”
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 registered 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
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.

*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 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.

<table>
<thead>
<tr>
<th>PLANTS</th>
<th>INSECTS CONTROLLED</th>
</tr>
</thead>
<tbody>
<tr>
<td>SHRUBS, TREES AND WOODY PLANTS</td>
<td>apple aphid, bagworms, birch leaf miner, boxelder bug, boxwood leaf miner, cankerworms, cattha sphinx, Cooley spruce gall aphid, Eastern spruce gall aphid, elm leaf aphid, elm leaf beetle, elm spanworm, hemlock woolly adelgid, gypsy moth, Japanese beetle, June beetles, lace bugs, leafhopper, leafrollers, mealy bugs, mites, psyllids, rose aphid, thrips (exposed).</td>
</tr>
<tr>
<td>HERBACEOUS ANNUAL, BIENNIAL AND PERENNIAL PLANTS</td>
<td>blister beetles, boxelder bug, flea beetles, Japanese beetle, June beetles, lace bugs, leafhoppers, leafrollers, mealy bugs, plant bugs, psyllids, rose aphid, thrips (exposed).</td>
</tr>
</tbody>
</table>

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 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.

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

Your Business can be one 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.
TREX-SAN®
BRAND
BROADLEAF HERBICIDE
Single applications of TREX-SAN in the spring and fall when the species are particularly vigorous will give you excellent control of more than 35 broadleaf weeds. Follow directions for use around trees, flowers and shrubs. TREX-SAN is the concentrated, synergistic combination of 2, 4-D, MCPP and DICAMBA that saves you time, space, and money.

PO-SAN®
BRAND
GROWTH RETARDATION OF FAIRWAY POA ANNUA
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.

PRE-SAN®
BRAND
PRE-EMERGENCE GRASS HERBICIDE
PRE-SAN applied in early spring prevents emergence of crabgrass, goosegrass and Poa annua throughout most of the summer to provide season long control, reapply PRE-SAN to prevent fall germination of these weed grasses. PRE-SAN is especially useful for putting greens.

Order Mallinckrodt all-seasons herbicides now.
WHY YOU SHOULD MAKE A CORPORATE CONTRIBUTION TO THE AD COUNCIL

Do you really know what happens when business profits go up or down?

The book that turns 1 into best sellers.

ONE-SEVENTH OF YOUR EMPLOYEES MAY BE DYING. HELP SAVE THEIR LIVES.

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.

Mail to: Robert P. Keim, President
The Advertising Council, Inc.
825 Third Avenue, New York, New York 10022
☐ Please send us your material

Name__________________________
Company______________________
Address_______________________
City/State/Zip__________________

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.

Mail to: Robert P. Keim, President
The Advertising Council, Inc.
825 Third Avenue, New York, New York 10022
☐ Please send us your material

Name__________________________
Company______________________
Address_______________________
City/State/Zip__________________

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.

Circle 109 on free information card
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.
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.

If there was a better way to Harvest Sod
BROUWER would have it!

Brouwer will build your Harvester to order in time for Spring Harvesting, ACT NOW.

The BROUWER can —
★ Roll, Slab or Fold turf.
★ Cut 15”, 16”, 18” and 24” wide turf in various lengths.
★ Cut square yards or square metres.
★ Pallet sizes are up to 60” wide.
★ Produce up to 1,500 square yards per hour.
★ Be installed on standard Ford or Massey-Ferguson Tractors.
★ NOW AVAILABLE with Large Floatation Tires — 19.5 x 24.

Write or call for brochure and full details of the affordable easy to handle and maintain, BROUWER.
**TRELAN**

"Whole Tree Chipper"

Chips trees up to 17" dia. and produces high quality chips at a rate of over 25 ton per hour . . . .

For more information, write or call -

STRONG MANUFACTURING COMPANY
Phone (517) 561 7591

Circle 166 on free information card

---

**CROWNVETCH IS THE BEAUTY QUEEN** of the erosion controlling plants and she's an easy keeper.

Our agronomist will be pleased to consult with you on any problem areas; our prices are as follows:
- Crowns: 100 to 1000, 14¢ each; 1100 to 5000, 12¢ each; 5100 to 10,000, 8¢ each; 10,000 or more, 7½¢ each.
- Crowntvetch 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:

ERNST CROWNVETCH FARMS
R.D. 5, Meadville, PA 16335
PHONE: 814-425-7276 or 425-7897

Circle 135 on free information card

---

**Improves with age.**

Take stock in America.
Buy U.S. Savings Bonds.

---

**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."

---

**CROWNVETCH IS THE BEAUTY QUEEN** of the erosion controlling plants and she's an easy keeper.

Our agronomist will be pleased to consult with you on any problem areas; our prices are as follows:
- Crowns: 100 to 1000, 14¢ each; 1100 to 5000, 12¢ each; 5100 to 10,000, 8¢ each; 10,000 or more, 7½¢ each.
- Crowntvetch 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:

ERNST CROWNVETCH FARMS
R.D. 5, Meadville, PA 16335
PHONE: 814-425-7276 or 425-7897

Circle 135 on free information card

---

**Improves with age.**

Take stock in America.
Buy U.S. Savings Bonds.

---

**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."

---

**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."

---

**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."