1981 Manager's Guide to Buying
The Turfgrass Environment: Management Series Part III
Junipers: Varieties to Fit Any Landscape
"I wish my quarterbacks were as durable as this John Deere Tractor."

Coach Dan Spadoni, Dollarway High School, Pine Bluff, Ark.

Last season, Coach Spadoni had all four of his quarterbacks out at one time or another with injuries.

But his John Deere 850 Tractor never missed a day's work.

"In the two years we've had it, we've used it to mow both of our football fields, the practice field and the grounds around the school," says Coach Spadoni.

"And we've never had any problems. Even opposing teams have told us ours is the best field they've played on!"

Which, of course, is why Coach Spadoni and School Superintendent James Matthews decided to buy a John Deere 'Little-Big' Tractor in the first place.

**Not too big, not too small**

They were looking for a tractor big enough to handle a large-acreage mowing job. Yet small enough so it would be economical to buy and operate.

The 22-PTO-hp* John Deere 850 filled the bill on both counts.

Its compact, water-cooled, 3-cylinder diesel engine has the power and stamina to run a rotary mower day after day, year after year. Yet being a diesel, it gives the kind of fuel economy a school's budget really appreciates.

**More than just a mower**

Another reason Coach Spadoni picked the John Deere 850 is its versatility.

It has a well-spaced 8-speed transmission that can match up to just about any job you want to do, plus a differential lock.

It has a Category I 3-point hitch, 540-rpm PTO and adjustable drawbar, plus more than 20 power-matched implement options.

And it's available in a variety of different tire styles and sizes.

**Built to last**

Of course, like all John Deere tractors, the 22-PTO-hp 850 is built to last.

"You can actually feel how solid it is when you ride it," says Dan Spadoni.

And to prove it, we ask only that you test drive one yourself at your nearby John Deere dealer.

Try out the 850, the 27-PTO-hp 950 or the new 33-PTO-hp 1050 with turbocharged diesel engine!!

See for yourself why John Deere 'Little-Big' Tractors are a big winner with schools, parks and golf courses everywhere.

Nothing runs like a Deere®

For more information, write John Deere, Dept. 63, Moline, Illinois 61265.

Leasing available—John Deere Tractors, Skid-Steer Loaders and matching equipment may be leased for commercial or agricultural use. For details, see your John Deere Consumer Products Dealer.

The little-big tractors from John Deere

Write 136 on reader service card
Banvel®
your Big Plus
Solution
to year round
vegetation
management

BANVEL adds a Big vegetation control PLUS to every vegetation management program.

More and more vegetation supervisors and applicators are switching to BANVEL® Industrial herbicides. They have learned that the broad spectrum vegetation control of BANVEL formulations makes an ideal addition or substitution for the popular phenoxy herbicides in vegetation management programs.

Name any tough vegetation problem... broadleaf weeds... woody brush... or vines. We have a BANVEL herbicide program to keep problem vegetation in check.

There's a BANVEL Industrial formulation program for any need... roadside... railroads... utilities... drainage ditches... forestry projects... industrial sites... and many more.

Let us show you how you can cut application costs with our low oil or no oil application programs.

We have developed a BANVEL Industrial Vegetation Program for effective vegetation management all year long — spring... early summer... fall... or winter dormant applications.

Let our Velsicol Industrial Herbicide Specialists build a BANVEL Vegetation Control Program to meet your specific problems and needs. Contact us today.

Industrial Vegetation Control Department
Velsicol Chemical Corporation
341 East Ohio Street
Chicago, Illinois 60611
Velsicol is a subsidiary of Northwest Industries, Inc.
CONTENTS

GREEN INDUSTRY NEWS
Sod Producers Gather for Summer Convention and Field Days in Alberta ... Nursemen Withstand Kansas City Heat at Annual Meeting ... Lawn Institute Elects New Officers.

FEATURES
Herbicides' Effects on Turf Disease
Professor Clinton Hodges of Iowa State researched the physiological changes on turfgrasses from lab applications of 2,4-D, 2,4,5-T, MCPP, and dicamba.

SEED ESTABLISHMENT, SOD INSTALLATION—TURF MANAGEMENT SERIES, PART 3

1981 GREEN INDUSTRY BUYER'S GUIDE
An updated source of ready information for purchasing and comparing equipment, chemicals, and supplies. This version gives what is available and where to get it.

Junipers Offer Variety of Designs
This well adaptable and multi-shaped tree variegates innumerable landscape designs, according to Horticulturist Doug Chapman.

Vegetation Management
Classified
Advertiser Information

Cover: Dwarf Japanese Garden Juniper, Procumbens 'Nana,' is a slow growing ground cover for flowering trees such as Malus floribundi.
Sod Convention Brings Industry Together

Manufacturers of sod equipment, seed distributors, turfgrass researchers, and sod growers from throughout Canada and the U.S. exchanged ideas at the American Sod Producers Association summer convention and field days in Edmonton, Alberta.

Under three days of July sunny skies, close to 600 ASPA members, families, and representatives of the turfgrass industry together enjoyed serious discussion and Western Canadian style entertainment.

When most arrived on Sunday, Edmonton was in full swing of its celebration of Klondike Days which relive an era past when settlers first began flooding the area for the rush of gold. Townspeople dressed in colorful garb of those days strutted through the downtown streets blocked to traffic.

Business began on Monday with a panel discussion in the host Four Seasons Hotel on “survival during an economic recession.” Ray Johnson of Shamrock Turf Nurseries moderated the panel of speakers chosen from various geographic regions. Although all the speakers agreed that nothing is certain with the economy and that if they knew the answers they’d be millionaires, they said housing projections range to 23 million in the 80’s, a good indicator of what the sod business will be.

Big Lake Sod Farm, Ltd. hosted the irrigation demonstrations Monday afternoon and on Tuesday Don Stumborg, convention chairman, hosted the field demonstrations and exhibits on his 2,900-acre Gem Sod Farms. Observers could not come close enough to the new equipment and innovations revealed.

Roseman Mower Corp., Nunes Mfg., and Brouwer Turf Equipment demonstrated their latest mowers; Nunes Turf Vac Corp., and Brouwer picked up the clippings with their sweepers; Delmarva Textile Co. and Conwed Corp. exhibited netting; Spyder Mfg. Co., Princeton Mfg. Co., and Brouwer showed how their forklifts handle sod pallets, which became filled from the work of harvesters made by Brouwer, Nunes, and Princeton. Ryan/OMC Lincoln demonstrated its sod cutter and Ferguson Fabrication ran a test of its sod extruder.

The manufacturers, constantly improving their equipment for the sod industry, showed efficiency in all areas — fuel, labor, and time. Observers said that some of these improvements would revolutionize the industry.

NURSERY

Nurserymen’s show faces heat and inflation

An optimistic attitude overcame the scorching temperatures and fears of inflation at the American Association of Nurserymen’s 105th Annual Convention and Trade Show held in Kansas City, MO, July 12-16.

With Kansas City and other parts of the country facing temperatures of 105° to 110°, over 1,300 nursery men and women attended the convention activities. The activities included 77 exhibits represented by 63 firms; a tour to the Rosehill Garden Growing Field, which held a demonstration of nursery equipment for wholesale growers; a landscape/garden center tour covering successful garden centers in the city’s suburbs; and a new program designed for juniors and teens to make this year’s convention a family affair.

Fighting inflation and developing employee incentives were two of the primary themes explored in the general sessions.

Dr. Jerry Robertson of Ohio State University said that the market increase in the landscape industry, which was 12.6 percent per year since 1967, has only been 4.2 percent with inflation. Robertson said the production of nursery crops, landscape products, and services to the trade must increase at least at the rate of inflation.

One of the greatest effects on productivity is labor, according to Sidney Meadows, Flowerwood Nursery, AL. He said: “Because of the escalation in wages, there is a need in an escalation of output or we’ll price ourselves out of the market. The labor costs are 25 to 35 percent of the sales dollar out of nursery stock.”

Another important factor affecting labor relations is the performance standards, said Bill Studebaker, Studebaker Nursery, OH. “Performance standards improve employee morale and increase output. They also allow you to set piecework rates, if necessary, for even the various or less glamorous tasks.”

John Flemer, Princeton Nurseries, Princeton, NJ, has combined years of study and experience on the problem. He said “compensation, communication, and concern” are the three main aspects in the management of workers, which is also an effective means to head-off

Continues on page 113
Sure, there’s more to maintaining quality, disease-free turfgrass than a couple of fertilizer applications. But turfgrass scientists across the country are reporting that a fall application of IBDU (31-0-0) can produce turfgrass with better root development and less disease problems.

Dormant turfgrass plants continue to produce rhizomes and roots, even though vertical growth has stopped. During this time nitrogen should be made available to the turfgrass plant as carbohydrates are naturally accumulating. Thus, scientists say, the optimum timing for nitrogen applications is during the fall and early winter months.

IBDU (31-0-0) is ideally suited for dormant nitrogen fertilization. Because of its slow release characteristics based on hydrolysis, IBDU releases nitrogen later in the fall and earlier in the spring promoting better rhizome and root growth. A fall fertilizer program using IBDU should produce healthier more vigorous turfgrass plants and reduce the severity of several turfgrass diseases.

Remember. Healthy turf next spring starts with IBDU this fall.

Healthy Turf Next Spring Starts With IBDU This Fall

PAR EX® and IBDU® are registered trademarks of Estech General Chemicals Corporation.

Write 116 on reader service card

Estech General Chemicals Corporation
Professional Products Division
P.O. Box 1996
Winter Haven, Florida 33880
“I could sure use a rugged mid-sized rotary that really maneuvers.”
A lot of our customers have been wanting a mid-sized mower that’s built tough to take it, and that’s highly maneuverable at the same time.

So our engineers came up with the amazing Turfcat.

It’s amazing because it’s absolutely packed with features that help you get your medium-sized mowing jobs done faster and better than ever.

First, you have a choice of a 50" or 60" deck. (They’re interchangeable.) Fully articulated, they closely follow ground contours so you get a smooth, even cut with practically no scalping.

Deck design lets you trim close, and also gives super clipping dispersion. The deck raises and lowers hydraulically for curb climbing and transport.

And you can adjust cutting height from 1" to 4".

Then, the three-wheel, wide track design gives the Turfcat great stability on slopes. And the foot-operated hydrostatic drive lets you steer and maneuver while changing speeds or going from forward to reverse.

How about hill climbing? It’s a breeze with the power delivered by the husky 18-HP Kohler overhead valve engine. And you can expect a long engine life filled with good fuel economy.

Plus, the Turfcat is quiet. All controls are within easy reach. And it might very well be the most comfortable riding rotary in the world.

Ask your Jacobsen distributor for a Turfcat demonstration. And have him explain about the many fine features that customers want.

The more you listen to what he has to say, the more you’ll know we’ve been listening.

We hear you.
Postemergent herbicides are indispensable tools for the maintenance of high quality turf. Most temperate origin grasses show good tolerance to the auxin-like herbicides (2,4-D, 2,4,5-T, MCPP, dicamba) but absorption of the herbicides by tolerant grasses has aroused interest in the potential influence the herbicides may have on the physiology of the tolerant grass. Studies with various crops have examined potential interactions between herbicides in tolerant and non-tolerant species and the severity of diseases. Since most postemergent herbicides are synthetic growth regulating hormones, much interest also has been directed at their immediate effect on the growth and reproduction of plant pathogenic fungi. The purpose of this presentation is to summarize research conducted in our laboratory on the influence of postemergent herbicides (2,4-D, 2,4,5-T, 2,4,5-TP, MCPP, dicamba) on the biology of Helminthosporium sorokinianum (= Drechslera sorokiniana) and on the severity of leaf spot on Kentucky bluegrass.

**Herbicide Effects on the Pathogen**

Leaf spot development induced by *H. sorokinianum* involves the life processes of both the pathogen and the leaf of the grass plant. The effect of any substance on the development of the lesion must be viewed relative to both living entities. The influence of 2,4-D, 2,4,5-T, 2,4,5-TP, MCPP, and dicamba show various stimulatory and inhibitory effects on the germination of *H. sorokinianum* conidia, growth of germ tubes, mycelium growth, and conidia production. Relatively high concentrations (10-3M) of these herbicides prevent the germination of conidia, but more dilute concentrations (10-4 to 10-12M) have no effect on germination. These observations suggest that the concentrations of 2,4-D, MCPP, and dicamba currently used for weed control in turf will neither inhibit nor stimulate the germination of *H. sorokinianum* conidia.

The most dramatic effect of 2,4-D, 2,4,5-T, 2,4,5-TP, MCPP, and dicamba on *H. sorokinianum* is stimulation of growth of conidia germ tubes after germination. The growth of germ tubes may increase 2X to 3X in response to various concentrations of each herbicide. Only 2,4,5-TP demonstrates some inhibition of germ-tube growth at higher concentrations. The significance of germ-tube stimulation relative to infection of leaves and disease development is unclear. It is well established that stimulation of the growth of a pathogen is not necessarily related to its ability to increase disease.

Most of the commonly used postemergent herbicides will stimulate mycelium growth of *H. sorokinianum* in culture. MCPP and dicamba are stimulatory in very dilute amounts. 2,4-D shows stimulation at high concentrations. The importance of mycelium stimulation relative to disease development is unknown. Such stimulation could, however, be of some importance in aiding *H. sorokinianum* to colonize dead grass tissue.

The influence of postemergent herbicides on the ability of *H. sorokinianum* to produce spores is mixed. 2,4,5-T and MCPP inhibit sporulation at most concentrations. 2,4-D, 2,4,5-TP, and dicamba show some stimulation of sporulation. These observations could be important to the ability of *H. sorokinianum* to produce spores on dead grass tissue; herbicide stimulated or inhibited spore production could subsequently influence the number of potential infections.

**Herbicide Effects on Leaf Spot Development**

Research conducted in our facilities over the last six years has established that the postemergent, synthetic auxin-like herbicides (2,4-D, 2,4,5-T, 2,4,5-TP, MCPP, and dicamba) can function in a host-pathogen-herbicide interaction involving *H. sorokinianum* and Kentucky bluegrass, to increase or decrease leaf spot severity. Kentucky bluegrass exposed to 2,45-T, MCPP and dicamba by means of leaf sprays or soil applications and then infected with *H. sorokinianum* show a 2X to 3X increase in leaf spot severity. Plants sprayed with 2,4-D and then infected generally show no change in disease development, but 2,4-D applied to the soil increases disease severity markedly. 2,4,5-TP applied to Kentucky bluegrass as a spray or as a soil drench inhibits leaf spot development at higher concentrations and stimulates development at lower concentrations.

Recent studies in our laboratory have established that herbicide stimulation of *H. sorokinianum* leaf spot on Kentucky bluegrass is associated with the aging process of the leaves. Leaf spot normally becomes more severe on each older leaf of the shoot; when the shoot is exposed to 2,4,5-T, MCPP, or dicamba and infected the increase in disease is least severe on the youngest leaves and most severe on the older leaves.

**Mechanism of Herbicide Stimulated Leaf Spot**

Existing plant science literature suggests that auxin-like herbicides may function to retard or to stimulate the aging process in leaves. Such observations may provide some insight into the host-pathogen-herbicide interactions resulting in more severe leaf spotting of Kentucky bluegrass. It seems that in a very general way, auxin-like herbicides introduced into young leaves, where cell division and expansion is occurring, may help maintain this youthful condition; however, introduction of the
same auxin-like herbicide into fully developed leaves where cell division and expansion have ceased, and where normal aging processes have started, may increase the rate at which the leaves age. It is known that leaf spot severity increases on each older leaf of the shoot; i.e., leaf spot is enhanced by the aging processes of each older leaf. Therefore, when the two oldest fully developed leaves of the shoot are exposed to auxin-like herbicides they may age at a faster rate and, if infected, the disease will increase in severity. This concept is less clear relative to disease development on the youngest, expanding leaves. The increase in leaf spot severity on the youngest, visible leaf of Kentucky bluegrass exposed to auxin-like herbicides is less than that on each older leaf; in fact, 2,4-D will not increase the disease on the youngest leaf. The youngest leaf often shows the same or slightly higher disease levels in response to the auxin-like herbicides. The two youngest leaves are in a very youthful condition and as such do not respond to infection with extensive yellowing and blighting. Hence, the youthfulness of these leaves retards extensive disease development; the promotion of disease on these leaves by the herbicides is minimal. The slight elevation in disease is not explainable relative to aging because in young, expanding leaves the auxin-like herbicides would probably be youth promoting. The greater increase in disease on the second oldest leaf still suggests a herbicide-aging interaction that increases disease.

**Significance of the Herbicide-Leaf Spot Interaction in the Field**

Observations on the stimulation of *H. sorokinianum* leaf spot on Kentucky bluegrass by postemergent, auxin-like herbicides have been made under the controlled conditions of greenhouse and growth chamber studies. To date, experimental evidence from field studies has not been obtained. The leaf spot symptoms produced in response to herbicides in greenhouse studies, however, are not unlike those observed in the field during late spring, summer (with irrigation), and fall to early winter. It is probable, therefore, that herbicide stimulation of leaf spot may occur in the field. Such stimulation probably would be erratic in its occurrence; i.e., the herbicide, pathogen, and proper moisture and temperature must occur simultaneously to increase the severity of leaf spot. Early spring applications of herbicides probably would have little effect on leaf spot development because of the lush, youthful condition of the leaves; with normal senescence, however, in late spring and early summer the herbicides may be a factor in increasing leaf spot severity, especially with irrigation or during a wet season. Preliminary studies suggest that increasing temperature from 72° to 86° will increase the yellowing and blighting caused by leaf spot on plants exposed to herbicides. This suggests that on irrigated Kentucky bluegrass auxin-like herbicides could have a substantial effect on promoting leaf spot damage during periods of warm weather. Auxin-like herbicides might be most promotive of leaf spot in fall and early winter when shorter daylength, and the herbicides may contribute to the rate at which leaves age and subsequently predispose them to more severe leaf spot development.

**Acknowledgements**

I wish to thank the O.J. Noer Research Foundation for financial support of much of the research from which this abstract is derived. WTT

---

**Severity of leaf spot** increases on each older leaf of a Kentucky bluegrass shoot in response to 2,4-D, 2,4,5-T, MCPP, and dicamba. A. Youngest leaf shows small brown lesions with minimal yellowing of tissue around lesions. B. The second youngest leaf shows enlarged brown lesions and an increase in yellowing of tissue around lesions. C. Next to the oldest leaf on the shoot showing enlarged brown lesions and yellowing that surrounds and interconnects lesions. D. The oldest leaf of the shoot shows very large lesions and extensive yellowing of the entire leaf. Leaf spot severity normally increases on each older leaf, but the herbicides increase the level of disease beyond what normally occurs.
Looking for one source for all your lawnmower & small engine replacement parts?

Stop Looking!
We manufacture and stock one of the largest inventories of quality replacement parts for lawnmowers, small air-cooled engines, and replacement trimmer line.

We've grown simply because our quality, inventory and servicing are second to none.

WE INVITE YOU TO SEND FOR OUR FREE CATALOG TODAY!
Pair for the Course

Penncross Penneagle

Penncross greens are known around the world for their consistent, high quality putting surface. Penncross has genetic diversity assuring disease resistance... germinates fast, establishes quicker... superbly consistent, less grain for true putts... greens up earlier, holds summer color better... great for overseeding winter greens in south.

Penneagle was developed through 18 years of research and 5 years of testing. This new variety of creeping bentgrass has these selected attributes of a great all-purpose grass for the entire course. Penneagle has a broad genetic base for greater climatic adaptability... is not overly aggressive, but competitive with Poa annua... has tight, more upright growth characteristics... is finer leafed than most bents... has excellent putting and playing qualities... was bred for disease resistance.

For more information about Penncross or Penneagle write:

Penncross Bentgrass Growers Assn.
1349 Capitol N.E., Salem, Oregon 97303

Call collect for your nearest dealer:

12306 West 102nd Street
Lenexa, Kansas 66215
913-492-1587

Write 140 on reader service card.
SITE CONSIDERATIONS

Progress in turfgrass science provides today’s lawn installers with high quality turfgrass seed and sod. The biggest risk has therefore become the readiness of the site for the seed or sod.

The site must provide the physiological needs of the desired turfgrass. The purpose of this article is to describe these needs and how to alter a site to supply them.

No professional lawn installation should proceed without a thorough evaluation of the site and a soil test. The results should be discussed with the customer for a simplified explanation of the needs of the desired turfgrass. Geographically impractical turfgrass species should be eliminated and the customer’s desired level of maintenance should be established. Share your knowledge of improved turfgrasses. There is a good selection of both seed and sod so the customer can have a custom lawn. Today, a quality lawn is a sales tool in real estate. The residential customer can have an individualized lawn in addition to a sales advantage.

The commercial customer installing a new lawn at its building site is a tougher challenge. If the landscape architect is not up on improved turfgrasses, it takes a strong salesmen to get improved varieties in the specifications. Too many industrial sites, multi-family housing developments, and shopping areas are seeded or sodded with outdated or cheap turfgrass varieties. The low bid process encourages this unless the improved turfgrasses are specified during bidding.

The scope of commercial jobs also encourages the use of hydraulic seeding with higher seed rates. Hydraulic seeding has grown in popularity as the least labor intensive way to seed all types of lawns. General contractors often want the lawn installation handled quickly and simply. This, however, is not always the best for the site. The owner must clearly specify his desire for quality turf by the best methods available. To achieve a quality lawn, some hand seeding and sodding is usually required. The hydraulic seeder is a great tool, however, research on the use of hydraulic seeding for fine turf is limited.

The health of a turfgrass plant is entirely dependent upon its environment, both above and below the soil surface. Once the seed has germinated, that plant must adapt to its fixed position or die. Man has the knowledge and ability to amend both above and below surface environments so that the turfgrass plant has optimum growing conditions. The best time to make the changes is before planting or sodding. If the basic needs of the turfgrass are provided, the plant will exercise its own ability to adapt to the stress of heat, drought, or wear. Turfgrass selection and breeding have provided turfgrasses that exhibit greater ability to adapt to stress. That does not reduce the need for site preparation in the case of fine turf.

Site preparation can be more than soil preparation. It could include thinning tree cover, installation of irrigation or drainage, filling low spots, changing slopes, installation of anticompression or erosion control netting, or even installing a sidewalk to direct foot traffic off the lawn. Any change which improves the turfgrass environment is considered site preparation.

The environment must provide all essential requirements for the life processes of the turfgrass. These include light, water, numerous chemical elements, and air (gases). The environment should also include preventative conditions, such as air circulation, drainage, relatively neutral pH, minimal thatch, and few insects.

All chemical reactions are temperature dependent, require energy, and can be influenced by chemical balances, such as acidity, cation exchange capacity, and the presence of needed elements. Understanding basic chemical reactions of plant growth helps clarify the need for site preparation.

The most important process is photosynthesis. In photosynthesis, carbon dioxide from the air and water are converted to organic carbon compounds which are used in plant growth. Light energy, absorbed by the chlorophyll in the plant, powers this reaction. Lack of carbon dioxide is rarely a problem, but water and light can be lacking very easily. Excessive shade or drought are common problems in turf areas.

The carbohydrates produced by photosynthesis are either utilized to power other growth and maintenance reactions or stored.

One major use of carbohydrates is respiration, in which the car-
Carbohydrates and oxygen react to release energy and to produce carbon dioxide and water. The plant uses the energy released to power other vital life processes. Respiration is increased by higher temperatures or nitrogen fertilization. It is important that the plant maintain a reserve of carbohydrates for use when plant needs exceed carbohydrate production by photosynthesis. Excessive respiration, caused by overfertilization can deplete these reserves. Storage is greatest on sunny, cool days, especially just prior to onset of winter dormancy. Nitrogen fertilization at this time is discouraged.

One reason nitrogen encourages respiration is its part in protein synthesis. Nitrogen is a key element in amino acids, a major component of protein. Protein is the structural material of cell walls and the plant's genetic code. Abundant nitrogen stimulates growth and the respiration to support it.

Many other elements play a part in the various biological reactions of plant existence. They supply needed components for physiological processes. Specifically, potassium and phosphorus are critical for a good seedbed because they affect root health. The ability of rhizomous and stoloniferous turfgrasses to spread is also dependent upon adequate levels of potassium. Low potassium levels encourage carbohydrate reserve depletion. Potassium does leach, especially in sandy soils and needs to be replenished. Phosphorus is relatively stable in soil and is not prone to leaching. Consequently, phosphorus should be mixed with the topsoil.

Other important elements are calcium, sulfur, magnesium and a score of other minor elements. Calcium encourages root growth, effects the cation exchange capacity of the soil, and often improves general soil structure. Sulfur is an important part of protein synthesis, it also can be used to acidify alkaline soils. Magnesium is an important part of chlorophyll and effects the green color of turfgrass stands. It is also part of protein synthesis and influences the use of available phosphorus in the plant.

Minor elements include iron, zinc, copper, chlorine, boron, molybdenum, and manganese. Iron assists in the production of chlorophyll and will deepen the color of turf. Most minor elements can be unavailable to plants if soil is too acidic or alkaline. The role of some of the

<table>
<thead>
<tr>
<th>Element</th>
<th>Chemical symbol</th>
<th>Importance in plant function</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nitrogen</td>
<td>N</td>
<td>The nitrate form is reduced to amino acids which are used to synthesize proteins, such as the structural protein of cell walls. Important in formation of nucleic acids which control genetic code of the plant. Also important in synthesis of coenzymes, vitamins, hormones, and pigments.</td>
</tr>
<tr>
<td>Potassium</td>
<td>K</td>
<td>Important in the glycolic pathway, one of four reaction sequences in the respiration process which converts glucose produced by photosynthesis into plant energy. Functions primarily as an enzyme activator.</td>
</tr>
<tr>
<td>Phosphorus</td>
<td>P</td>
<td>Also important in formation of nucleic acids. Is a constituent of phospholipids, which with proteins, constitute membranes which maintain structural integrity of plant cells. Important in organic compounds which provide energy for chemical reactions.</td>
</tr>
<tr>
<td>Sulfur</td>
<td>S</td>
<td>A constituent of certain amino acids and protein. Also found in coenzymes for lipid (fat) and carbohydrate metabolisms.</td>
</tr>
<tr>
<td>Calcium</td>
<td>Ca</td>
<td>Important in developing cell structure and permeability properties of membranes.</td>
</tr>
<tr>
<td>Iron</td>
<td>Fe</td>
<td>Essential for chlorophyll synthesis.</td>
</tr>
<tr>
<td>Magnesium</td>
<td>Mg</td>
<td>An essential constituent of chlorophyll. Seems to function by binding together subunits which make up ribosomes which synthesize proteins.</td>
</tr>
<tr>
<td>Boron</td>
<td>B</td>
<td>Unknown. Suggested that borates prevent excess phenolic acid production. Phenolic acids accumulate in boron deficient plants.</td>
</tr>
<tr>
<td>Copper</td>
<td>Cu</td>
<td>Found in enzymes required for respiration and photosynthesis.</td>
</tr>
<tr>
<td>Zinc</td>
<td>Zn</td>
<td>Found in several enzymes essential to respiration and nitrogen metabolism.</td>
</tr>
<tr>
<td>Molybdenum</td>
<td>Mo</td>
<td>Found in enzyme for N₂ fixation, and enzyme essential for reduction of nitrates (NO₃⁻) to ammonia.</td>
</tr>
<tr>
<td>Chlorine</td>
<td>Cl</td>
<td>Activates oxygen production system of photosynthesis.</td>
</tr>
<tr>
<td>Sodium</td>
<td>Na</td>
<td>Required by certain halophytic (salt-loving) plants.</td>
</tr>
<tr>
<td>Silicon</td>
<td>Si</td>
<td>Required by some grasses and sedges for cell wall formation.</td>
</tr>
</tbody>
</table>
minor elements is not clearly understood. Sandy and alkaline soils may require addition of minor elements.

The purpose is not to give a lesson in chemistry, but to show those things that a turfgrass plant requires from its environment. The next step is to identify site conditions which either permit or restrict the supply of these needs. Since soil is the medium for most of these needs, it is the best place to start.

Soil

The goal in site preparation is to provide a six to eight inch layer of soil that has desirable texture, structure, and chemical balance. The components of the soil determine these characteristics. Soil amendment may be needed to establish a suitable rootzone for the turfgrass.

Soil is layered. The primary concern is the few inches of topsoil, but lower layers effect drainage, upward movement of water, and chemical activity. Special care to all layers of soil is given during construction of golf greens and other athletic fields. On large areas where lower layers may pose problems but the scale makes changes impractical, special attention should be given to maintenance needs, such as topdressing, aerification, fertilization, and installation of drainage and irrigation systems. The purpose is to counterbalance the effects of an inferior soil.

The typical soil of an area is derived from the parent material which may have been the bottom of a lake, a glacier, a volcano, or other mineral or organic material. Other factors influencing soil content are the climate of the area, the period of time during which the soil developed, the vegetation that had grown there previously, and the topography of the area. All these factors combined resulted in the soil characteristics of any area.

Soils are classified by type or combination of types, including sand, silt, and clay. (See diagram). These identify textural characteristics of the soil. Soils are also classified by structure based upon the shapes of individual groups of particles, or aggregates, in the soil. The size of the aggregates is also a factor in seedbed preparation. Pea-sized aggregates are preferred.

The texture and structure of a soil has a great effect on drainage, movement of chemicals in the soil, upward movement of water (capillary action), rooting ability, and presence of needed gases in the soil. Loam soil is actually a combination of sand, silt and clay.

Another way to classify soils is as mineral or organic. The organic matter content of mineral soils is less than ten percent, whereas organic soils contain more than 20 percent organic matter. Organic soils are preferred where possible. Michigan sod growers switched from mineral soils to organic soils as part of their growth in the 60's. If the organic matter is only slightly decomposed the soil is termed peat. If the organic matter is well decomposed the soil is termed muck.

Soils with large amounts of undecomposed organic matter need the assistance of bacteria, protozoa, nematodes, algae and fungi for breakdown. Poorly drained soils discourage these organisms from doing their job. These organisms also are essential for thatch decomposition and breakdown. Decomposition is also related to the pH of the thatch and soil. Alkaline or acidic soils can prevent the breakdown of thatch and cause problems associated with thatch buildup.

The composition of the soil effects water accumulation and drainage. Sand soils do a poor job of holding water. However, they have the advantage of aiding drainage when added to other soils. Clay soils hold water but this water may not be available to the plant roots. Silt soils retain water well but also tend to compact easily. The pore space between soil particles determines the ability of the soil to hold and pass water. The organic matter content of the soil also aids in water retention. The ability of the soil to let water in
NEW FOR '81

2-CYCLE

HIGH QUALITY
COMMERCIAL
MOWER

The newest mower from the No. 1-Choice SENSATION. Powered by a heavy duty 4.3 HP Kawasaki 2-cycle engine. All the features of Sensation 4-cycle mowers with positive engine lubrication for MOVING SLOPES, fewer moving parts to extend maintenance free mowing time and easy starting.

Sensation

for more information please contact
The Sensation Corporation
3601 North 16th Street, Omaha, Nebraska 68110 (402) 345-3864

IIL4-3

Standard of the industry

For high performance and rugged quality in a 4-cycle engine the IIL4 is your best choice. Add Sensation's standard features and the optional large capacity model 90J3 rear catcher and you've got a long lasting mower.
Texture is measured by the percentages of the three basic mineral components, clay, silt, and sand.

is called infiltration. If soils are compacted, pore space is limited and water will not flow into the soil easily. Water can be treated with wetting agents to reduce its surface tension and allow for easier entry.

The ability of the soil to allow water to pass through is called percolation. If soil layers are significantly different in texture, water movement downward can be hindered. If surface water is applied faster than the soil can take it in or let it flow through, puddling or runoff will occur.

The ability of the soil to hold water is closely related to its ability to hold needed gases. Many of the things that prevent water retention hinder soil aeration, such as compaction and lack of organic matter.

Water and air compete for the same space at times. Poor drainage inhibits soil aeration if water occupies all pore space. Turfgrass roots need oxygen to carry out respiration. Without the oxygen, the ability of the plant to power essential processes is severely restricted.

One final area of consideration for soils is the chemical balance. This is a more complicated subject concerning pH, cation exchange, and salinity. An imbalance of any of these can hinder the plant's health.

pH is a measure of the hydrogen ions in a solution. The more acid the soil is, the lower the pH will be. The

Porosity of soil determines compaction resistance as well as drainage and water and air retention.
Green, Green, Greener

THE BEST SEED SHOULD DO MORE THAN GROW GREEN GRASS

ADELPHI KENTUCKY BLUEGRASS continues to be a top performer in density, disease resistance, drought, heat and cold...and is completely free of noxious weeds.

ADELPHI has proven itself to be the greener Kentucky Bluegrass that is preferred on Parks, Schools, Cemeteries, Ball Parks and Golf Courses. Ask anyone who has used it.

For information, contact:

J & L ADIKES, INC.
Jamaica, N.Y. 11423

NORTHROP KING CO.
Minneapolis, Minn 55413

VAUGHAN-JACKLIN CORP.
Bound Brook, N.J. 08805
Downers Grove, Ill 60515
Post Falls, Idaho 83854

ROTHWELL SEEDS LTD.
Box 511, Lindsay
Ont. Canada K9V 4L9

Other International Inquiries: NORTHRUP KING CO., Minneapolis, Minn. 55413

Whitey Ford and Mickey Mantle play on their favorite grass (U.S. Patent No. 3150)
Acidity and alkalinity of regions in the U.S. (top) is closely related to average rainfall (bottom). Nutrient availability changes with soil pH. More alkaline, the higher the pH. The number 7 is considered neutral and is also the optimum pH for growing turfgrass. Many things can cause soil pH to change; irrigation water of a different pH and materials containing sulfur such as ammonium sulfate. Soils containing large amounts of clay and organic matter tend to be acid. Periodic applications of limestone may be necessary for these soils. Excessive acidity reduces the amount of available phosphorus in the soil, reduces the activity of beneficial soil organisms, and increases the ionic concentration of potentially toxic minerals such as aluminum and manganese. Secondary effects include poor rooting, increased thatch accumulation, and reduced turfgrass vigor. Due to the effect on rooting, pH should be checked prior to seeding or sodding and corrected. Acid rain is a possible source of acidity.

Alkaline soils are usually associated with areas that have saline ground water, low rainfall, or are waterlogged. Overuse of lime can cause alkaline soil conditions. Alkaline soils restrict the utilization of iron, manganese, copper, zinc, and boron by turfgrass. Sulfur or fertilizers containing sulfur can be used to neutralize alkaline soils.

Saline soils are associated with areas of low rainfall where soluble salts have not been sufficiently leached out over time. They tend to be present in the ground water making irrigation with it little help. Irrigation with collected rainwater or use of salt tolerant turfgrasses are the only practical remedies. In the same general category are sodic soils which contain high levels of soluble sodium. Sodium has a detrimental effect on soil structure causing the breakdown of aggregates and clay particles. Application of gypsum can improve sodic soils.

The most complicated phenomenon of soils is the cation exchange capacity. Basically, chemical reactions involve the attraction of positively charged molecules (cations) to negatively charged molecules (anions). Plants require positively charged molecules of elements to carry out basic processes, such as calcium and potassium. The plant depends on the soil to hold these cations until it can use them. The ability of the soil to exchange a cation of its own for one of benefit to the plant is termed cation exchange capacity. The type of soil, texture, and organic matter content affect cation exchange capacity. Addition of organic matter increases the cation exchange capacity of the soil. The higher the cation exchange the better the soil holds onto valuable nutrients. Leaching is reduced in these soils.

There is no one preferred CEC. It varies according to the type of clay, organic content, and other components. If correction was advised, addition of organic matter would be the likely solution.

To provide the best environment for seed or for sod rooting the soil should contain appropriate nutrients, be neutral or slightly acid (6.5 pH), have an acceptable CEC, contain aggregates by cultivation and moderating or eliminating sodic conditions, and organic content of at least 20 percent. Best results with sod rooting are obtained by purchasing sod grown on approximately the same type of soil as the site. Most sod is grown on muck soil. Decomposed organic material is preferred for amendment since decomposition of the organic matter consumes nitrogen that could be utilized by the turfgrass. Material should be composted before use.

To improve heavy clay soils, coarse sand can be mixed with the clay and organic matter to lower the clay content to 75 percent if possible. Calcined clay will also contribute to better water characteristics of soils. Sand and calcined clay can improve silty soils as well.

Sandy soils require the addition of clay and organic matter. Clay content of at least five percent is
Most lawn areas have both sun and shade naturally. That's why Glade Kentucky bluegrass is the natural choice. Specify Glade for your next turf grass mix. It's available at your local wholesale seed distributor.

Another fine, quality-controlled product of Jacklin Seed Company.
When Dave Portz renovated 14 fairways with Roundup®, the members played the same day he sprayed.

Cleaning up a weedy fairway doesn't have to be a slow, messy job for you—or a hardship for your golfers.

Roundup® herbicide helps make renovation fast and efficient—as Grounds Superintendent Dave Portz discovered last year.

"If we had chosen to plow the course under, we would've had to close it," Dave says. Instead, he applied Roundup on 14 weedy fairways, and reopened the course the same day. While Roundup worked, the members played over the dying turf, with no problems.

The members—and Dave—liked that. They were glad, too, that Roundup won't wash, leach or volatilize to injure desirable plants along the fairway. Dave simply took precautions against spray drift.

This year, reach for Roundup to control many tough weeds. It can make turf renovation fast and efficient for you—and leave a lot more playing time for your golfers.

For literature, call 1-800-621-5800, or in Illinois, 1-800-972-5858.

ALWAYS READ AND FOLLOW LABEL FOR ROUNDUP®. Ri-8011D
Roundup® is a registered trademark of Monsanto Co. © Monsanto Company 1980

There's never been a herbicide like this before.
Disease susceptibility and thatch buildup can be reduced by adjusting pH.

<table>
<thead>
<tr>
<th>pH</th>
<th>ACID</th>
<th>NEUTRAL</th>
<th>ALKALINE</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.0</td>
<td>NITROGEN</td>
<td>PHOSPHORUS</td>
<td>POTASSIUM</td>
</tr>
<tr>
<td>4.5</td>
<td></td>
<td>SULFUR</td>
<td>CALCIUM</td>
</tr>
<tr>
<td>5.0</td>
<td></td>
<td>IRON</td>
<td>MAGNESIUM</td>
</tr>
<tr>
<td>5.5</td>
<td></td>
<td>IRON</td>
<td>MAGNESIUM</td>
</tr>
<tr>
<td>6.0</td>
<td></td>
<td>IRON</td>
<td>MAGNESIUM</td>
</tr>
<tr>
<td>6.5</td>
<td></td>
<td>IRON</td>
<td>MAGNESIUM</td>
</tr>
<tr>
<td>7.0</td>
<td></td>
<td>IRON</td>
<td>MAGNESIUM</td>
</tr>
<tr>
<td>7.5</td>
<td></td>
<td>IRON</td>
<td>MAGNESIUM</td>
</tr>
<tr>
<td>8.0</td>
<td></td>
<td>IRON</td>
<td>MAGNESIUM</td>
</tr>
<tr>
<td>8.5</td>
<td></td>
<td>IRON</td>
<td>MAGNESIUM</td>
</tr>
</tbody>
</table>

**Turf Disease Harboring Range**

<table>
<thead>
<tr>
<th>pH</th>
<th>Thatch Build Up Range</th>
<th>Cellulose (Thatch) Decomposing Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>4.0</td>
<td>4.0</td>
</tr>
<tr>
<td>4.5</td>
<td>4.5</td>
<td>6.0</td>
</tr>
<tr>
<td>5</td>
<td>5.0</td>
<td>6.5</td>
</tr>
<tr>
<td>5.5</td>
<td>5.5</td>
<td>7.0</td>
</tr>
<tr>
<td>6</td>
<td>6.0</td>
<td>7.5</td>
</tr>
<tr>
<td>6.5</td>
<td>6.5</td>
<td>8.0</td>
</tr>
<tr>
<td>7</td>
<td>7.0</td>
<td>8.5</td>
</tr>
<tr>
<td>7.5</td>
<td>7.5</td>
<td>8.5</td>
</tr>
<tr>
<td>8</td>
<td>8.0</td>
<td>8.5</td>
</tr>
<tr>
<td>8.5</td>
<td>8.5</td>
<td>8.5</td>
</tr>
</tbody>
</table>

Desired. Fine sand content should be reduced as much as possible.

The perfect soil has never really been determined. The United States Golf Association recommends that pore space should be in the range of 40 to 55 percent. Since the size of sand, clay aggregates, and organic material varies, arriving at one combination is impossible. California research has indicated a mixture of 85 percent sand (.25 mm and bigger), 7.5 percent clay, and 7.5 percent peat is successful. That is an impractical amount of sand in the case of soil modification.

Continues on page 97
Books for the Green Industry

Just Published!

**TURFGRASS MANAGEMENT**
by A.J. Turgeon
Brand new approach and terminology to provide a concise, consistent picture of the current state of turfgrass science and technology.
**$16.95** hardback

**TURF MAINTENANCE**
_Pascal Pirone_
The fourth edition of this guide for anyone involved in the care and treatment of trees. Special sections on tree abnormalities, diagnosing tree troubles, non-parasitic injuries and assessing the suitability of different trees throughout the country.
**$27.50**

**DISEASES & PESTS OF ORNAMENTAL PLANTS**
by Pascal Pirone
This standard reference discusses diagnosis and treatment of diseases and organisms affecting nearly 500 varieties of ornamental plants grown outdoors, under glass or in the home. Easy to understand explanations of when and how to use the most effective fungicides, insecticides and other control methods.
**$22.95**

**DISEASES OF SHADE TREES**
by Terry Tattar
Because shade trees require specialized maintenance rarely used in the forest, this text seeks to aid the arborist in providing necessary care to maintain vigor and prevent shade tree diseases. An indepth look at infectious and non-infectious tree diseases. Plant pathology not necessary.
**$23.50**

**TREE SURGERY**
by P.H. Bridgeman
This practical guide to equipment required and operation methods attempts to give an up-to-date picture of the modern industry. Includes illustrative photographs and detailed line drawings.
**$17.00**

**THE PRUNING MANUAL**
by Everett F. Christopher
Latest information on pruning fruit and shade trees, ornamental shrubs and roses. 100 diagrams and photographs. Sections also devoted to forestry, grafting, root pruning, wound treatment and tools.
**$10.00**

**TREE CARE**
by John M. Haller
Urban trees are subjected to every kind of environmental stress and abuse requiring continuous attention to keep them healthy. This book gives you the how-to’s of planting, feeding, pruning, repairing and defending trees against their enemies with special coverage of environmental damage and miscellaneous troubles.
**$9.00**
HANDBOOK OF LANDSCAPE ARCHITECTURAL CONSTRUCTION
edited by Jot Carpenter
A practical how-to reference on landscape construction. Published by The Landscape Architecture Foundation, the book carries the expertise of more than 25 landscape professionals.
$48.50

WESTERN HOME LANDSCAPING
by Ken Smith, LA
Illustrations and descriptions of western landscape plants and structures for your design idea file. Covers foolproof plants, irrigation, patios and decks, walls, pools, and shelters.
$5.95

HOME LANDSCAPE
by Garrett Eckbo
Provides designs, examples, and current innovations and refinements to older traditional designs. Covers all aspects of residential landscape planning.
$16.00

HORTUS THIRD
from Cornell University
A 1,300-page concise dictionary of plants cultivated in the United States and Canada. A reference which every horticultural professional should have.
$99.50

INSECTS THAT FEED ON TREES AND SHRUBS
by Johnson and Lyon
Essential information for identifying more than 650 insect pests and the injuries they cause. More than 200 color illustrations.
$38.50

TREE IDENTIFICATION
by George Symonds
Pictorial reference to identifying trees by checking leaves, buds, branches, fruit and bark. Like its sister publication, Shrub Identification, popular and botanical names are listed with index tabs for easy reference.
$9.00 paperback

SHRUB IDENTIFICATION
by George Symonds
Pictorial key to identify shrubs. Contains more than 3,500 illustrations to check specimens. Popular and botanical names are given for each shrub with handy index tabs for quick reference.
$18.00 hardback $8.00 paperback

Mail to: Book Dept.
Harvest Business Publications
9800 Detroit Avenue.
Cleveland, OH 44102
Master Card or Visa (Circle one)
Acct. No. ____________________________
Expiration Date ________________
Name ____________________________
Address ____________________________
City ______ State ______ Zip ______
Signature ____________________________

Please send the following books. I have enclosed a check or authorized a charge for the total amount.

<table>
<thead>
<tr>
<th>Title</th>
<th>Quantity</th>
<th>Price</th>
<th>Total Price</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Add $1.25 per book for handling and shipping.

Total enclosed ____________________________
With an all Brouwer package, you can improve your bottom line.

Brouwer Harvesters give you a more uniform cut, less down time, less top soil removal and a harvester that operates off the uncut turf. Over 1000 Top Turf men around the world use Brouwer Harvesters to assure themselves top profit.

Brouwer Mowers give a smoother cut at lower cost. The lightweight high-stress steel frame combined with the simple, "no-wheel and gear" P.T.O. drive minimize flattening and avoid wheel tracks. The new Brouwer hydraulic lift mowers add another time saving innovation at a very low cost.

The Brouwer Package is easy to buy, easy to maintain, and fuel efficient. That means money in your pocket—a better return on your investment.

Write for our free Brouwer Harvester and Mower brochures.

Brouwer Sod Harvesters—Cut, Roll, Slab, Fold, all grasses, all seasons, all conditions in 15, 16, 18 and 24 inch widths and choice of pallet sizes.

Brouwer 7 gang P.T.O. mowers—cuts up to 7 acres per hour at normal speed with 30 HP Tractor. Unique Positive P.T.O. Drive uses less horsepower, successfully operates in varying grass conditions.

Brouwer 5 gang hydraulic lift P.T.O. mowers offer all standard Brouwer mower features plus hydraulic lift.

Brouwer Turf Equipment Limited, Woodbine Ave., Keswick, Ontario, Canada L4P 3E9 Tel: (416) 476-4311
1981 Manager's Guide to Equipment, Chemicals, Supplies and Distributors

1. Equipment
From aerators to vibratory plows, manufacturers of the tools and materials for outdoor maintenance

2. Equipment Companies
Alphabetical listing by manufacturers' names of who makes what, with address and phone number

3. Chemicals and Supplies
From adjuvants to wetting agents, a comprehensive list of liquids, granulars, and organic compounds for turf and trees

4. Chemical Companies
Alphabetical listing by manufacturers' names with address and phone number

5. Seed Companies
A full line of growers and marketers

6. Equipment Dealers
A state-by-state breakdown of who to contact; includes Canada

7. Chemical Dealers
Where to find chemicals and supplies in every state
What do turfgrass experts say about Pennant® ryegrass?

The Turf Trial results speak for themselves. Pennant is a champion. Rigidly controlled, comparative testing involving Pennant and competing varieties of perennial ryegrasses were conducted by turf experts across a broad region of the U.S.—the Pacific Northwest, the Southwest, the Northeast. Pennant topped many of its competitors in these tests, including overseeding and heat tolerance trials in the Southwest. Some of the expert's findings are illustrated below.


<table>
<thead>
<tr>
<th>Variety</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>YORKTOWN II</td>
<td>6.4</td>
</tr>
<tr>
<td>PENNANT</td>
<td>6.3</td>
</tr>
<tr>
<td>CITATION</td>
<td>5.9</td>
</tr>
<tr>
<td>DERBY</td>
<td>5.4</td>
</tr>
<tr>
<td>PENNFINE</td>
<td>5.4</td>
</tr>
<tr>
<td>MANHATTAN</td>
<td>5.2</td>
</tr>
</tbody>
</table>


<table>
<thead>
<tr>
<th>Variety</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>PENNANT</td>
<td>7.5</td>
</tr>
<tr>
<td>PENNFINE</td>
<td>7.0</td>
</tr>
<tr>
<td>DIPLOMAT</td>
<td>6.3</td>
</tr>
<tr>
<td>YORKTOWN II</td>
<td>6.2</td>
</tr>
<tr>
<td>MANHATTAN</td>
<td>5.8</td>
</tr>
<tr>
<td>CITATION</td>
<td>5.8</td>
</tr>
<tr>
<td>REGAL</td>
<td>5.8</td>
</tr>
<tr>
<td>DERBY</td>
<td>5.8</td>
</tr>
<tr>
<td>PENNFINE</td>
<td>5.8</td>
</tr>
</tbody>
</table>

Pennant was best among 12 varieties tested for red thread disease (Corticium fuciforme) in 1-year average, 1979-80. Western WA. (Low score - Best).

<table>
<thead>
<tr>
<th>Variety</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>PENNANT</td>
<td>0%</td>
</tr>
<tr>
<td>PENNFINE</td>
<td>0%</td>
</tr>
<tr>
<td>DIPLOMAT</td>
<td>14%</td>
</tr>
<tr>
<td>YORKTOWN II</td>
<td>18%</td>
</tr>
<tr>
<td>MANHATTAN</td>
<td>30.4%</td>
</tr>
<tr>
<td>CITATION</td>
<td>32%</td>
</tr>
<tr>
<td>REGAL</td>
<td>40.4%</td>
</tr>
<tr>
<td>DERBY</td>
<td>47.8%</td>
</tr>
</tbody>
</table>

Pennant was also found to maintain its excellent turf color and quality late into the season. Pennant will impress you with its rich, moderately dark green hue, its fine leaf blades, and its improved mowing properties. We call it "The Trophy Turf". We think you will, too.

For additional information regarding Pennant's truly remarkable Turf Trial performance, contact: Agriculture Service Corporation. P.O. Box 101, Harrisburg, OR 97446. Telephone: (503) 995-6124

Write 113 on reader service card
How to choose the right iron.
Choosing the right golf club is a serious matter. You need one that's just right for the shot you have to make. You should take into account the distance, wind, lie, and obstacles.

At Kubota, we feel that you should devote the same careful attention to choosing a tractor.

YOU WOULDN'T TEE OFF WITH A BASEBALL BAT.

And you wouldn't want to get the wrong tractor for the jobs you have to do.

Whether you take care of a golf course, an estate, a campus, a park, or do roadside maintenance, you want a tractor that's versatile. Can it handle a mid-mount mower? A gang mower? Can it move dirt? Dig a hole? Kubotas can do all these things. Every Kubota has rear PTO and a 3-point hitch that can accommodate a wide variety of implements. You don't want a tractor so specialized it can do only one job.

Another thing you don't want is a tractor that's too big or too small.

KUBOTA. THE MID-SIZE TRACTOR.

Our tractors range from 12 to 81 horsepower. Small enough for economy, large enough for heavy-duty jobs. It's wasteful to use 100 horses for some mowing. And it's impossible for 10 horses to do heavy moving or hauling.

DIESELS. A KUBOTA SPECIALTY.

At Kubota, we've been making diesel engines for 30 years. In fact, all our engines are diesels.

Diesel engines are rugged and durable. They have no electric ignition system, so they never need a tune-up. And running a Kubota diesel engine costs a lot less than running a comparable gasoline engine.

With many models to choose from, we have a tractor that's just right for the maintenance job you have to do. So see your Kubota dealer today. He'll help you get hold of the right iron.
1. Equipment

**Aerators, Aquatic**
- Barebo, Inc.
- Clean-Flo Laboratories, Inc.
- Hinde Engineering Co.
- Kembro
- Clean-Flo Laboratories, Inc.
- Hinde Engineering Co.
- Kembro
- Olathe Mfg. Co. Inc.
- Ryan Turf Equipment
- Wheel Horse Prod.

**Aerators, Soil**
- Brinly-Hardy Co.
- Chipmore Mfg. Co.
- Cushman OMC-Lincoln
- Dobbins Inc.
- FD Kees Mfg. Co.
- Giant Vac Mfg. Co.
- Hahn Inc.
- Howard Rotavator Co. Inc.
- Jacobsen Mfg. Co., Div. of Textron Inc.
- Lindig Mfg. Corp.
- Olathe Mfg. Co. Inc.
- Ryan Turf Equipment/OMC Lincoln
- Toro Co.
- Wheel Horse Prod.

**Agitators**
- Hydroflo Corp.
- Hynpro, Inc., Div. of Lear Siegler Inc.

**Aquatic Weed Cutters**
- Air-Lec Industries Inc.
- Aquamarine Corp.
- Hockney Company

**Aquatic Weed Harvester**
- Aquamarine Corp.

**Aquatic Weed Shade Cloth**
- Menardi Southern Corp.

**Augers**
- Danuser Machine Co.
- Erickson Corp.
- Ground Hog Inc.
- Hoffco Inc.
- Int'l. Reforestation Supplies
- John Deere & Co.
- Massey Ferguson
- Rhino by Athens & Servis, Austin Prod.
- States Engr. Corp.
- Stihl Inc.
- Tanaka Kogyo (USA)

**Backfillers**
- Brown, Roscoeq Corp.

**Back Hoes**
- Brillon Iron Works
- Brown, Roscoe Corp.
- Ditch Witch Div., Charles Machine
- J C Case, Davis Div.
- John Deere & Co.
- Vermeer Mfg. Co.

**Batteries, Turf Vehicle**
- Delco Remy, Div. GM
- ESB Inc.
- Gould Automotive Battery Div.
- John Deere & Co.
- SGL Battery
- Trojan Battery Co.
- Wheel Horse Prod.

**Battery Chargers**
- ESB Inc.
- Massey-Ferguson
- Wheel Horse Prod.

**Benches**
- Algoma Net. Co.
- American Playground Device Co.
- Belson Mfg. Co.
- Chadwick Mfg. Co.
- Columbia Cascade Timber Co.
- Dentin Mfg. Co.
- Game Time Inc.
- Gerber Mfg. Inc.
- Delmer F. Harris Co., Inc.
- Howmet Aluminum Corp.
- J. E. Burke Co.
- Jamison Inc.
- Kay Park-Rec Corp.
- L. A. Steelcraft Prod.
- Landscape Forms
- Leisure Craft Inc.
- Lister Teak Furniture
- Mexico Forge-Kilgore
- Milroy Mfg. Inc.
- Miracle Recreation Equip.
- Morrison Molded Fiberglass
- Park Structures Inc.
- Patterson-Williams
- Playtime Equip. Corp.
- Rosenwach Inc.
- Ryther-Purdy
- Stadiums Unlimited
- Standard Golf Co.
- Trojan Playground Equip.
- Victor Stanley Inc.

**Blades, Dozer/Scraper**
- Allis-Chalmers
- Brillon Iron Works
- Dountz Equip. Co.
- Erickson Corp.
- Ford Motor Co., Tractor Operations
- Grasshopper Co.
- Green Manufacturing, Inc.
- International Harvester
- John Deere & Co.
- Vermeer Mfg. Co.
- Wheel Horse Prod.

**Bleachers**
- All American Outdoor Seating
- Alum-a-Products Corp.
- Belson Mfg. Co.
- Bil-Jax Inc.
- Howmet Aluminum Corp.
- Kay Park-Rec Corp.
- L. A. Steelcraft Prod.
- Medalist Standard Steel
- Patterson-Williams
- Playtime Equip. Corp.
- Portableachers Inc.
- Safway Steel Prod.
- Stadiums Unlimited
- Sturdisteel

**Blowers**
- Atwater Strong
- Echo Inc.
- Giant Vac Mfg. Co.
- HMC, Green Machine
- Jacobsen Mfg. Co., Div. of Textron Inc.
- John Deere & Co.
- Sperry New Holland
- Toro Co.
- Vanderwolten Corp.
- Yard Vac

**Bridges**
- Continental Custom Bridge
- De Bourgh Mfg. Co.
- L. B. Foster
- OME Inc.
- Standard Golf Co.
- Western Wood Structures

**Brush Cutters, Hand Held**
- John Deere & Co.
- Echo Inc.
- HMC, Green Machine
- Hoffco Inc.
- Homelite Div., Textron
- Solo Motors Inc.
- Stanley Hydraulic Tools
- Stihl Inc.
- Tanaka Kogyo (USA)
- Walbro Corp.
- Weed Eater
- Wilson, D. J., Co.

**Brush Cutters, Right-of-Way**
- Bennington Tractor Co.
- Bombardier Ltd.
- John Deere & Co.
- Kershaw Mfg. Co.
- Massey-Ferguson
- National Hydro-Ax, Inc.
- NFI, Inc.
- Rhino by Athens & Servis, Austin Prod.
- Royer Foundry & Machine Co.
- Vemco Corp.
- Washington Industrial Resources

**Bucket Lifts**
- Calavar Corp.
- Correct Mfg. Corp.
- Durnell Engineering Inc.
- Hunt-Pierce Corp.
- JLG Industries, Inc.
- Mobile Aerial Towers Inc.
DISCOVER AMERICA!
Experience the Beautiful Freedom of a Less Demanding Bluegrass

Efforts of University specialists and turf experts combine to bring you this outstanding new Kentucky bluegrass...bred and tested to meet the needs of turf growers who ask for a less demanding, better performing bluegrass. Low growing and compact with good disease resistance, dark green, fine textured and showing good shade tolerance...

America's superior qualities are being discovered by sod growers, greenskeepers and landscapers everywhere. Join them today and discover America for yourself!

Pickseed also produces Touchdown Kentucky Bluegrass

Write 129 on reader service card

Produced by Pickseed West Inc.
Equipment continued

Pitman Mfg. Co.
Reach-All Mfg.
Schwartz Mfg.
Seaman Co.
Telelect.
Time Mfg. Co.
USA Lift Inc.
Wheel Horse Prod.

Chain Saws

Alis-Chalmers
Alpina North America Inc.
Echo
Homelite Div., Textron
Husquvarna Inc.
John Deere & Co.
Massey-Ferguson
McCulloch Corp.
Milwaukee Electric Tool
New Draulics, Inc.
Robinson Ind., Limb Lopper
Skil Corp.
Sole Inc.
Stanley Hydraulic Tools
Stihl Inc.
Tanaka Kogyo (USA)
Tensen Company, Inc.
Toro Co.
Walbro Corp.

Chippers

Asplundh Mfg. Div.
Chipmore Mfg. Co.
Didier Mfg.
FMC, Outdoor Power Equip. Div.
Gruender Co.
Lindig Mfg. Corp.
Mitta & Merrill Inc.
Morbark Ind. Inc.
Olathe Mfg. Co. Inc.
Piqua Engr. Inc.
Rhino by Athens & Servis, Austin Prod.
Rover Foundry & Machine Co.
Safety Test Inc.
Spartan Tree Equip. Co.
Strong Mfg. Co.
Tensen Company, Inc.
Vandermolen Corp.
Vermeer Mfg. Co.
Woodchuck Chippers

Cranes

Air Technical Industries
Auto Crane Co.
Cascade Corp.
Dountz Equip. Co.
GS Industries
J.I. Case, Drott Div.
Ideal Crane Co.
Reach-All Mfg.

Cultivators

Alis-Chalmers
Bomford & Evershed Ltd.
Brillon Iron Works
Derby Tiller Co.
Ferrari Int.
FMC, Outdoor Power Equip. Div.
Ford Motor Co., Tractor Operations
Fuerst Brothers Inc.
Giant Vac Mfg. Co.
Honda Power Equip.
Howard Rotavator Co. Inc.
John Deere & Co.
Lambert Corp.
Massey-Ferguson
McDonough Power Equip.
Precision Valley Mfg. Co.
Rhino by Athens & Servis, Austin Prod.
Tradewinds, Inc.
Union Fork & Hoe Co.
Wheel Horse Prod.
White Farm Equip.

Dethatchers

E-Z Rake Inc.
FD Kees Mfg. Co.
Giant Vac Mfg. Co.
Hahn Inc.
Hann Corp.
Lewis Systems
Mathews Co.
Ryan Turf Equipment/OMC Lincoln
Thatch-Away Mfg. Co.
Vemco Corp.
Yard Vac

Dozers

Caterpillar Tractor Co.
International Harvester
John Deere & Co.
Massey-Ferguson

Drainage Tubing

Advanced Drainage System
Francesville Drain Tile Corp.
Hancor Inc.
National Diversified Sales, Inc.
Phillips Petroleum Co.

Dredgers

Aztex Development Co.
Dredgeast, Inc.
Mud Cat Division, Nat'l Car Rental Sys.

Drills

Milwaukee Electric Tool
Robinson Ind., Limb Lopper
Stanley Hydraulic Tools

Dusters

Buffalo Turbine Ag. Equip.
Chapin Mfg. Works
D. B. Smith & Co.
Gustafson Mfg. Co. Inc.
HMC, Green Machine
Root Lowell
Vandermolen Corp.

Edgers

Bunton Co.
Excel Industries
Hartwig-Hartglass, Inc.
John Deere & Co.
K-D Mfg. Co.
Old Dutch Materials Co.
Turfco Prod. Co.
Weed Eater Inc.
Yard Vac

Engines

Allis-Chalmers
Briggs & Stratton Corp.
Clinton Engines Corp.
Detroit Diesel Allison, Div. GMC
Ford Industrial Engine Operations
Honda Power Equip.
Kawasaki Motors Corp.
Kohler Co.
Onan
Suzuki
Tecumseh Prod. Co.
Teledyne-Wisconsin Motor

Erosion Control Fabric

Carthage Mills
Construction Techniques Inc.
Nicolon Corp.
Jim Wallis Company

Forklifts

Brouwer Turf Equip., Ltd.
J.L. Case, Davis Div.
Dynamic Industries Inc.
Guest Industries, Inc.
Hario Products Corp.
International Harvester
K-D Mfg. Co.
Komatsu Forklift (U.S.A.) Inc.
Massey-Ferguson
Master Craft Ind. Equip. Corp.
Spyder Sales & Service, Inc.
States Engineering Corp.

Generators

Allis-Chalmers
Homelite Div., Textron
Honda Power Equip.
John Deere & Co.
Kohler Co.

Grass Pavers

Grass Pavers Ltd.
Turfgrass Prod. Co.

Greenhouses

Archway Greenhouses
Atelee Burpee Co.
B.F.G. Supply Co.
Cloud Co.
Dayni Controls Mfg. Co.
Enclosures Inc.
Environmental Dynamics
Filon Home Greenhouse
Hansen Weatherport
J. A. Nearing Co.
Lord & Burnham
McGregor Greenhouses
National Greenhouse Co.
Reliable Greenhouses
Sturdi-Built Mfg. Co.
Sunglo Greenhouses
Texas Greenhouse Co.
Turner Equipment Co.
Vegetable Factory
Verandel Co.
Water Works Garden Houses
Webber Systems Inc.

Greenhouse Covers

Keystone Group
A WHOLE TREE CHIPPER AT A BRUSH CHIPPER PRICE

Chip trees and limbs up to 12" in diameter — Chip sawmill slabs — Chip Christmas trees — Chip dry material — No need to cut to length with the heavy duty Eeger Beever. A safe machine with no wood kickback — Operator can feed from curbside — Makes a dimensional chip — Operates with low fuel consumption and is no more expensive than a brush chipper.

Write 158 on reader service card.

THE EEGER BEEVER WILL OBSOLETE THE CONVENTIONAL BRUSH CHIPPER BECAUSE:

• It’s more productive.
• It will last longer.
• It’s less expensive to operate.
• It’s less expensive to maintain.
• It’s a safer machine to operate.


Chip hardwoods, softwoods, whole trees, brush and Christmas trees.

CALL THE EEGER BEEVER HOT LINE: 517-866-2381

DEALER AND DISTRIBUTOR INQUIRIES INVITED

MORBARK INDUSTRIES, INC.
WINN, MICHIGAN 48896
HIRE
THE INSECTICIDE
THAT LIKES TO
WORK OVERTIME.

DURSBAN* brand insecticides provide unsurpassed residual control of cutworms, chinch bugs, sod webworms, and a dozen other turf pests. Both DURSBAN 2E Insecticide and double-strength DURSBAN 4E Insecticide keep working a lot longer than other turf insecticides. This residual action saves you time, trips, and labor. It also saves you money. In fact, DURSBAN insecticides cost less than most other turf insecticides. Ask your supplier for the turf insecticide that works overtime for you. Get DURSBAN 2E Insecticide or double-strength DURSBAN 4E Insecticide. Just be sure to read and follow all label directions and precautions. Agricultural Products Department, Midland, Michigan 48640.

*Trademark of The Dow Chemical Company

DOW CHEMICAL U.S.A.
Superintendents, Contractors, Lawn Care Managers, New, On-the-Job Reference. The Turf Managers' Handbook is a comprehensive, organized approach to turfgrass science and care. It has been designed and written by leading turf specialists from Purdue, Dr. William Daniel and Dr. Ray Freeborg, for on-the-job reference and as a text for students.

The book contains 150 illustrations and 96 color photographs. Data includes 240 tables and forms. Included are specifications for rootzones, employment, calculations for chemical applications, and extensive metric-imperial conversion. Business and technical aspects of turfgrass management are covered in this 424-page book. Planning, purchasing, hiring, construction, and plant selection are put together for easy on-the-job reference. Markets covered include lawn care, sod production, golf course management, cemeteries, athletic fields, and low maintenance areas. If it concerns turf, it's in the Turf Managers' Handbook.
Equipment continued
Poly-America Inc.

Hose and Reels
John Deere & Co.
Dountz Equip. Co.
Flexitube Ind. Corp.
Clifford B. Hannay & Son, Inc.
Minnesota Wanner Co.
F. E. Myers Co.

Insect Killers, Electrical
Detjen Corp. Insectocutor Div.
Insect-O-Cutor Inc.

Irrigation, Drip
Aquatic Irrigation Systems
Chapin Watermatics, Inc.
Dayni Controls Mfg. Co.
Drip-Eze
Drip-Iigation Co.
Global Irrigation Corp.
Holly Filter
Pepco Submatic Irrigation Systems
Raindrip Inc.

Irrigation, Injection
Agri-Systems Div., Min-Max Int’l., Inc.
Fert-O-Ject
Inject-O-Meter Mfg. Co., Inc.

Irrigation, Mobile
Ag-Rain Inc.

Irrigation, Systems & Supplies
Ag-Rain Inc.
Agtronics Mfg. Co.
Ametek/Plymouth Prod.
Aqua Dial
Aqua Turf
Aquatic Irrigation Systems
Batrow Inc.
Beeco Products Co.
Century Rain-Aid
Champion Sprinkler Equip.
Consolidated Pipe & Tube
Dayni Controls Mfg. Co.
Dema Engr. Co.
Drip-Eze
Drip-Iigation Co.
Flo Control Inc.
General Irrigation Co.
GF Plastic Systems Inc.
Greenfield Traveling Sprinklers
Griskaud Controls
Hydro Engr.
Hydro Terra Corp.
Hydroflo Corp.
Irrometer Co., Inc.
Johns Manville, Buckner
K-Rain Mfg.*Corp.
King Bros. Ind.
Lakos
Long Mfg. N.C. Inc.
Lumenite Electronic Co.
Melnor Ind. Inc.
Microdot Prod.
Moody Sprinkler Co. Inc.
Nelson LR
Olson Irrigation Systems
Pringle Mfg. Co.
Progressive Electronics Inc.
Pumping Systems Inc.

Rain Bird
Rain-O-Mat Sprinklers, Inc.
Raindrip Inc.
Richdel Inc.
Royal Coach Sprinklers
Signet Scientific
Skinner Irrigation Co.
Smith Precision Prod.

Telsco Ind.
Thompson Mfg. Co.

Toro Irrigation Div.
Travelrain
Valcon Auto Ir. Equip.
Weather-Tech. Corp.
Weathermatic, Div. of Telsco Ind.

Lighting Systems
Appleton Elect. Co.
Architectural Area Lighting Co.
Centrecon Inc.
Crouse-Hinds Co.
Emerson Electric
General Electric Co.
Intermatic, Inc.
Johns-Manville
Little Giant Corp.
McGraw Edison Co.
Millerbernd Mfg. Co.

The Swenson Pickup Package.
Heavy duty ice and snow control for light and medium duty vehicles.

When street and highway maintenance departments want top quality ice and snow control equipment, they come to Swenson. Now, you can too. The Swenson Pickup Package has been trimmed down in size. But we didn’t cut corners on quality.

In front, there’s an Easy-Hitch snow plow. Rugged and maneuverable, it mounts or dismounts in minutes. The driver has complete in-cab control. And it’s custom engineered to fit the newest ’80 and ’81 trucks.

In back, there’s a PV-300 V-box material spreader. It mounts and stores as a single unit. Capacity is over 1½ yards. And it’s powered by either an auxiliary gas motor or the truck’s hydraulics.

Whether you need a plow, a spreader, or the complete package, now you can insist on Swenson quality. Call today for the name of your nearest dealer.

Swenson—the tough choice.

Write 124 on reader service card
Equipment
continued
Muscatine Lighting Mfg. Co.
Spring City Electrical Mfg. Co.
Street Lighting Equip. Corp.
Weisbach Lighting Inc.
Wide Lite

Litter Receptacles
Clean City Squares
Columbia Cascade Timber Co.
Landscape Forms
Leisure Craft Inc.
Mexico Forge-Kilgore
Milroy Mfg. Inc.
Plastic Omnium Inc.
Rosenwach Inc.
United Metal Rec. Corp.

Loaders
Allis-Chalmers
American Coupler Systems, Inc.
Clark Equip. Co.
Dynamic Industries Inc.
Erickson Corp.
E-Z-Go Div. of Textron
FMC Corp., Bolens Div.
Ford Motor Co., Tractor Operations
Giant Vac Mfg. Co.
Hydra-Mac, Inc.
International Harvester
JCB Inc.
J I Case, Davis Div.
John Deere & Co.
Kubota Tractor Corp.
Massey-Ferguson
Owatonna Mfg. Co., Inc.
R & R Prod. Inc.
Schwartz Mfg.
Sperry New Holland
Wheel Horse Prod.
White Farm Equip.

Log Splitters
Didier Mfg.
Giant Vac Mfg. Co.
International Harvester
John Deere & Co.
LaFont Corp.
Lindig Mfg. Corp.
Morbark Ind. Inc.
Northeast Industries, Inc.
Olathe Mfg. Co., Inc.
Piqua Engr. Inc.
Vermeer Mfg. Co.
W-W Grinder Inc.

Markers, Field
Carlson Co.
Decadrant
Fox Valley Marking Systems
Richway Industries Ltd.
Trusco Mfg. Co.
Unimasco Inc.

Measuring Wheels
Rolatape Corp.

Mist Blowers
F. E. Myers Co.
HMC, Green Machine
Root Lowell

Solo Inc.

Mowers, Flail
Bornford & Evershed Ltd.
Brillion Iron Works

Excel Industries
Ford Motor Co., Tractor Operations
Hefty Tractor Co.
Hesston, Woods Div.
International Harvester
John Deere & Co.
Mathews Co.
Mott Corp.
Tiger Corp.
Turner International Ltd.
Vemco Corp.

Mowers, Reel
Brouwer Turf Equip. Ltd.
Cushman/OMC-Lincoln
National Mower Co.
Roseman Mower Co.
Roxy-Bonner Inc.
Toro Co.

Mowers, Rotary
Allis-Chalmers
Ariens Co.
Billy Goat Ind.
Bolens Div. FMC Corp.
Bunton Co.
Bush Hog Implements
Continental Belton Co.

Excel Industries
FD Rees Mfg. Co.
Flymo Co.
FMC, Outdoor Power Equip. Div.
Ford Motor Co., Tractor Operations
Goodall
Grasshopper Co.
Gravely
Haban Mfg. Company
Hahn Inc.
Heckendorf Mfg. Co.
Hefty Tractor Co.
Hesston, Woods Div.
Honda Power Equip.
Howard Price Turf Equip.
John Deere & Co.
Kut-Kwick Corp.
Lawn-Boy
Massey-Ferguson
McDonough Power Equip., Snapper
Mo-Trim Inc.
Nunces Mfg.
OME Inc.
Pen-Gro Sales Co.
Rhino by Athens & Servis, Austin Prod.
Roof Mfg. Co.
Ryan Turf Equipment/OMC Lincoln
Sano Power Mowers
Sensation Corp.
Simplicity Mfg. Co.
Smithco
Terrain King Corp.
Tiger Corp.
Toro Co.
Wheel Horse Prod.
Wisconsin Marine Inc.

Mowers, Sickle Bar
Allis-Chalmers
Didier Mfg.

Mulchers, Hydraulic
Bowie

Finn Equip. Co.
Reinco
Strong Mfg. Co.

Net Layers
Robark Inc.
Western Cascade Inc.

Netting
Conwed Corp.
Delmav Textile Co., Inc.

Netting, Erosion Control
American Enka Co.
Gulf States Paper Corp.
Turfibre Prod., Enkamat

Nozzles & Accessories
Broyhill Co.
Continental Beltco.
Delavan Corp.
F. E. Myers Co.
Minnesota Wanner Co.
Nelson Irrigation Corp.
Safe-T-Lawn
Spraying Systems Co.
Tri-con, Inc.
Waish Mfg. Co.

Parts
Aladdin Mfg., Mower, Aerator
Dayco Corp., Belts
Omark Ind. Inc., Chain Saws
Power Lawn Mower Parts,
Engines, Mowers
R & R Prod. Inc., Mower, Aerator
Sabre Saw Chain, Saw Chain

Patio & Walkway Materials
Langco Ltd.
Old Dutch Materials Co.

Picnic Tables
American Playground Device Co.
Belson Mfg. Co.
Chadwick Mfg. Co.
Columbia Cascade Timber Co.
Dentin Mfg. Co.
Game Time Inc.
Gerber Mfg. Inc.
Giant Mfg. Inc.
Howmet Aluminum Corp.
J. E. Burke Co.
Jamison Inc.
Kay Park-Rec Corp.
L. A. Steelcraft Prod.
Mexico Forge-Kilgore
Midwest Mfg. Co.
Milroy Mfg. Inc.
Paterson-Williams
Recreation Equip. Corp.
Sargent-Sowell Inc.
Stadiums Unlimited
Sturdisteel
Trojan Playground Equip.
Vee Ent.

42   WEEDS TREES & TURF/SEPTEMBER 1980
Introducing the Front Line.
The first mower built tough enough
to be a Cushman.

There's a good reason why Cushman has been around for
such a long time: We build
equipment that lasts a long time.
And that's never been more
obvious than with our new Front
Line rotary mower.

**Built for keeps.**
The Front Line's 72" mower
deck is made of 12-gauge carbon
steel, reinforced and arc welded. It
has a multi-disc PTO clutch, direct
drive to the deck gear box with a
sealed and lubricated shaft drive. The hydrostatic transmission is
driven by two continuously
engaged "A" section belts with
self-adjusting tension.

There's no need to worry
about overloading the Front
Line's engine. The combi-
nation of our high torque
engine and specially
designed mower deck
allows you to mow tall
weeds and fine grass.

**Superior performance.**
The Front Line's cut in fine
grass is so smooth, you won't
believe it was made with three
separate blades. That's because
the blades overlap 1½" to reach
every inch of grass in the full 72"
swath. Also, the cutting height
is adjustable to eight positions,
from 1" to 4½" in half-inch
increments.

Operating the Front Line
couldn't be easier. With individual
front wheel brakes, and wheel-
type steering controlling a single
rear wheel, you get tight maneuver-
ability and better control on
varying terrain.

The Front Line's mower deck
makes your job easier, too.
It extends
more than a foot to
one side, so you can trim right
up to fences or trees. And it lifts
hydraulically for transport over
curbs. What's more, a large capa-
city fuel tank lets you work up to
6 hours between refills.

**100% Cushman.**
Most rotary mowers use
engines built by outside suppliers.
Not the Front Line. Its 18-hp,
air-cooled engine is all-Cushman.
So is the differential. And the PTO
drive. Which means all parts and
service are provided by your
Cushman dealer.

Send us this coupon today,
and we'll tell you more about the
new Front Line: The only mower
built Cushman-tough.

YES, I want more information on the new Front Line™ rotary
mower. Prove to me that it really is tough enough to be a
Cushman.

Name ____________________________
Title ____________________________
Address ___________________________
City ____________________________ State ______
Zip __________ Telephone ___________

CUSHMAN

2079 Cushman. P.O. Box 82409, Lincoln, NE 68501
402-435-7208

The Front Line.
Tough enough to be a Cushman.
Stanley Hydraulic Tools introduces its PR29/30 heavy-duty tree pruners with a lightweight head that reduces operator fatigue. The pruners weigh only 9 pounds; are 7 feet, 2 inches long; and have a 2 1/4-inch cutting capacity. The PR29/30 comes with fiberglass or aluminum handles, both thermally insulated.

The Sensation Corp.'s latest mower is the 11L2-0 that is powered by a 2-cycle Kawasaki engine. Features of the 4.3-hp engine are a cast iron cylinder sleeve; few moving parts for less maintenance; positive engine lubrication for mowing slopes; a 5-quart capacity fuel tank; and a case hardened steel crankshaft. A non clog suction lift blade cuts a 21-inch swath from 1 to 3 inches in height in 1/4-inch increments.

J I Case features its DH4 hydrostatic drive trencher that permits forward/reverse and variable digging chain speeds with reduced engine problems. The DH4 trenches...
Your Ditch Witch 2200 or 2300 machines can become much more than just riding trenchers. Add the versatility of a utility backhoe, a hydraulic breaker and/or the hydraulic boring unit package...and you have added a lot more production potential.

The A220 Backhoe was specially designed for the 2200 and 2300 models. This 5-foot-range unit can help meet those unexpected underground construction challenges. It has an 8-foot, 6-inch reach and does not interfere with backfilling.

The Roto Witch III hydraulic boring unit, a hydraulic breaker or any of several hydraulic tools can be used on the same machine as the construction needs dictate.*

Yes, if you have 2200's or 2300's in your fleet, you've got more work potential than really meets the eye. Contact your nearest Ditch Witch dealer or send for more information.

*Quick-couple hydraulic manifolds are available as an option on 2200 and 2300 models.

Write 143 on reader service card
Equipment

continued

up to 406 mm (16 inches) wide and 1,829 mm (72 inches) deep. Two hydrostatic systems power the ground drive and the attachments.

Tuflex Mfg. Co. has introduced a fiberglass spray tank. The PC 200-gallon divided tank contains two separate 100-gallon compartments for diversified spraying. Throwing two valve switches, the suction and return line goes from one chemical spraying to the other.

Bowie Industries is combining its Hydro-Mulcher with Ag-Chem Equipment Co.'s Ag-gator 2004 all-terrain chassis for easy grass and plant growth in undeveloped areas and difficult terrains. The hydro-mulcher plants, seeds, sprigs, fertilizes, waters, sprays, and mulches in a one-step application that covers 200 feet.

Jacobsen Div. of Textron Inc., is offering the Turfcat, a riding rotary mower with an optional 54-inch dozer blade, front and rear traction weights, and tire chains. Besides dozing snow, debris, or materials, the machine mows with a 50- or 60-inch cutter deck.

Saws
Bartlett Mfg. Co.
Corona Clipper Co.
John Deere & Co.
Energy Inc.
Safety Test Inc.
Seymour Smith & Son
Stanley Hydraulic Tools
True Friends Garden Tools

Scrapers
Avcon Ind.
Caterpillar Tractor Co.
Eversman Mfg. Co.
Gill Mfg. Co.
International Harvester

Screeners
Lindig Mfg. Corp.
Royer Foundry & Machine Co.

Seeders, Hydraulic
Bowie
Finn Equip. Co.
Reinco
Strong Mfg. Co.

Seeders
Avco, E-Z Flow
Brillion Iron Works
Cyclone Seeder Co.
Dobbins Inc.
Gandy Co.
Jacobsen Mfg. Co., Div. of Textron Inc.
John Deere & Co.
Lambert Corp.
Larson Machine Inc.
Lawnmaker Mfg. Co.
Lely Corp.
Meredith Seed Miser
Toro Co.

Sharpeners
Bernhard Export
John Deere & Co., Chain Saw
Foley Mfg. Co., Chain Saw,
Mower, Chipper
Granberg, Chain Saw

Shears
Bartlett Mfg. Co.
Corona Clipper Co.
John Deere & Co.
Safety Test Inc.
Seymour Smith & Son Inc.
Skil Corp.
Stanley Hydraulic Tools
True Friends Garden Tools, Inc.

Shelters
Bock Industry Inc.
Cedar Forest Products Co.
Cuckler Bldg. Systems
Game Time Inc.
Koppers Co. Inc.
Kwik-Bilt Inc.
Mexico Forge-Kigore
Milroy Mfg. Inc.
Miracle Recreation Equip.
National Steel Prod. Co.
Park Structures Int.
Poligon
Shenango Steel Bldg.
Standard Golf Co.
Starco Co. Inc.
Timberlodge Inc.
Tubular Prod. Inc.
Walker/Parkersburg, Div. of Textron
Western Wood Structures

Snow Blowers
Excel Industries
FMC, Bolens Div.
FMC, Outdoor Power Equip. Div.
Grasshopper Co.
Jacobsen Mfg. Co., Div. of Textron Inc.
Lambert Corp.
McDonough Power Equipment
Toro

Snow Plows
Sun Trak Industries
Swenson Spreader Co.
Western Products Div.

Sod Cutters
Guest Industries Inc.
Jacobsen Mfg. Co., Div. of Textron Inc.
Ryan Turf Equipment/OMC Lincoln
Turfco Prod. Co.

Sod Equipment
Brouwer Turf Equipment Ltd.
Ferguson Welding & Spring, Inc.
Nunes Mfg.
R&R Products Inc.
Raverly's Sod Blades

Sod Harvester
Beck's Turf-Nursery, Inc.
Brouwer Turf Equip. Ltd.
Nunes

Soil Mixers
Clements Associates, Inc.
Ventura Mfg. & Implement Co.

Soil Sampler
Turfgrass Products Corp.

Soil Shredders
Griendler Co.
Lindig Mfg. Corp.
Royer Foundry & Machine Co.

Soil Test Labs
Hach Chem. Co.
HC Hellige Inc.
La Motte Chemical
Sudbury Laboratory Inc.

Soil Test Meters
A & H Marketing
Advanced Marketing, Inc.
Crane, Howard, Inc.
Hach Chemical Co., (pH)
Kel Instruments Co., Inc.
Soil Moisture Equip., Corp.

Sprayers
Ag-chem Equip. Co., Inc.
We Don’t Just Hand You A Line

Safety Test
Furnishes All Your Requirements For
- Bucket Work
- Industrial Safety
- Pole and Tree Climbing
- Tree Trimming
- Utility Maintenance
- Vegetation Management

ALSO
Complete Rubber Goods
Testing Laboratory

SAFETY TEST
AND EQUIPMENT COMPANY, INC.
P. O. DRAWER 400
SHELBY, N.C. 28150
PHONE 704-482-7346

Write 150 on reader service card

SEPTEMBER 1980/WEEDS TREES & TURF 47
Nitroform from Boots Hercules is the standard of quality by which all other nitrates are measured. It feeds naturally as your plants need it, balancing the feeding between roots and top growth.


If your fertilizer isn’t lasting long enough, it doesn’t contain Nitroform.
Systemic Plant Growth Regulator

DISTRIBUTORS

Agrotec, Inc.
Salisbury, MD
(301) 749-8496

Joe Berger & Co.
Renton, WA
(206) 235-4510

Cassco
Montgomery, AL
(205) 272-2140

E.C. Geiger
Harleysville, PA
(215) 256-6511

Growers International
Houston, TX
(713) 667-2405

A. H. Hummert Seed Company
St. Louis, MO
(314) 771-0646

Moyer Chemical Company
San Jose, CA
(408) 297-8088

Oregon Horticultural Supply Co.
Portland, OR
(503) 323-7138

Regal Chemical Company
Atlanta, GA
(404) 299-4075

Southern Agricultural Insecticides, Inc.
Palmetto, FL
(813) 722-3285

Target Chemical Company
Cerritos, CA
(213) 865-9541

Thornton & Wilson, Inc.
Maitenville, OH
(513) 683-2141

Turf Products Ltd.
West Chicago, IL
(312) 688-5537

Contact one of these
Atrina distributors or write—

Maag Agrochemicals Marketing
Hoffmann-La Roche Inc.
Nutley, N.J. 07110

Write 117 on reader service card

Equipment continued

Dethmers Mfg. Co.
Dobbins Inc.
Gandy Co.
Garber Seeders Inc., Power
Gustafson Mfg. Co., Inc., Power
Helix Corp., Power
Herb Seeders Inc., Broadcast
Highway Equip. Co., Truck Mounted
John Deere & Co.
Kohrhaing Co.
Lambert Corp.
Larson Machine Inc.
Lawnmaker Mfg. Co.
Leisure Lawn Inc.
Lely Corp.
O.M. Scott & Son
Severin Mfg. Co.
Skibbe Mfg. Co., Power
Sperry New Holland
Swensson Spreader Co.
Thomsen Prod.
Trac 'N Combo
Turfo Prod. Co., Truck Mounted
Viom Farm Mach.

Sprig Planters

Howard Rotavator Co., Inc.
Straw Blowers

Bowie
Finn Equip. Co.
Reinco

Stump Cutters

Big Trees Today Inc.
FMC, Outdoor Power Equip. Div.
Heckendorf Mfg. Co.
Leavo Mfgs., Inc.
Lindig Mfg. Corp.
Olathe Mfg. Co., Inc.
Promark Prod. West
Spartan Tree Equip. Co.
Vermeer Mfg. Co.

Sweepers

American Lincoln
American Water Broom Co.
Atwater Strong
Brinly-Hardy Co., Turf
Brouwer Turf Equip. Ltd.
Erickson Corp.
FMC, Sweeper Div.
Jacobsen Mfg. Co., Div. of Textron Inc.
John Deere & Co.
Kubota Tractor Corp.
Lambert Corp.
Life-Time Prod., Utility
Life-Time Prod., Heavy Equipment
Magline Inc.
Massey-Ferguson
Master Craft Trailers
OME Inc., Dumpers
OME Inc.
Owens Classic Inc.
Precision Products, Inc.
Ram Ind.
Selma Trailer & Mfg. Co.
Speedex Tractor Co.
White Farm Equip.
Yamaha Motor Co.

Vermeer Mfg. Co.

Tree Anchors

A.B. Chance Co., Consumer Products

Tree Movers

Beseler Tree Moving Equip.
Big John Tree Transplanter
Big Trees Today Inc.

Topdresser

Cushman OMC-Lincoln
Dobbins Inc.
Lely
Turco Mfg. Inc.

Tractors and Attachments

Allis-Chalmers
Bolens Div. FMC Corp.
Roscoe Brown Corp.
Engineering Products Co.
Ferrari Int.
Gravey
Gravey Equip. Co., Inc.
International Harvester
J I Case, Davis Div.
Jacobsen Mfg. Co., Div. of Textron Inc.
John Deere & Co.
Kubota Tractor Corp.
Lambert Corp.
Life-Time Prod., Utility
Life-Time Prod., Heavy Equipment
Magline Inc.
Massey-Ferguson
Master Craft Trailers
OME Inc., Dumpers
OME Inc.
Owens Classic Inc.
Precision Products, Inc.
Ram Ind.
Selma Trailer & Mfg. Co.
Speedex Tractor Co.
White Farm Equip.
Yamaha Motor Co.

Yanmar Diesel Engine Co.

Trailers

Allen-Clark Equip. Co., Dump
Blasius Electric Trunck, Inc.
Dayton Electric Mfg. Co., Dump
Holsclaw Bros.
John Deere & Co., Trimmers
Lambert Corp.
Life-Time Prod., Utility
Life-Time Prod., Heavy Equipment
Magline Inc.
Massey-Ferguson
Master Craft Trailers
OME Inc., Dumpers
OME Inc.
Owens Classic Inc.
Precision Products, Inc.
Ram Ind.
Selma Trailer & Mfg. Co.
Snowco
Trail/Dump Co.
Trooper Co.
Vermeer Mfg. Co.
Wells Cargo

Tank, Fiberglass

Brophy Co.
Burch Mfg. Co.
Continental Belton Co.
County Plastics Corp.
Ecor Spray Systems Div.
E F. Myers Co.
Fiberglass Unlimited, Inc.
Hemco Corp.
Raven Ind.

Tuflex Mfg. Co.
Walsh Mfg. Co.
Westcoo Mfg. Co.

Tanks, Metal

Broyhill Co.
Dountz Equip. Co.
Hydrollo Corp.
Minnesota Wanner Co.
Caretree Systems
Clegg, Nursery Equip. Co.
Del Zotto Mfg. Inc.
Robinson Ind.
Rokor Inc.
Schutt's Equip. Co.
Spartan Tree Equip. Co.
Vermeer Mfg. Co.

Tree Movers, Spades
Asplundh Chipper Co.
Besseler Tree Moving Equip.
Big John Tree Transplanter
Caretree Systems
Clegg, Nursery Equip. Co.
Del Zotto Mfg. Inc.
Mechanical Transplanter Co.
Robinson Ind.
Rokor Inc.
Schutt's Equip. Co.
Spartan Tree Equip. Co.
Vermeer Mfg. Co.

Trenchers
Auburn Cons. Ind.
Brown, Roscoe, Corp.
J I Case
Ditch Witch Div.
Erickson Corp.
International Harvester
Kraft Inc.
Seaman Co.
Vermeer Mfg. Co.

Trimmers, Line
Ben Meadows
Bunton Co.
John Deere & Co.
Echo
HMC, Green Machine
Hoffco
Hornelite Div., Textron
Stanley Hydraulic Tools
Toro Co.
Weed Eater

Truck Bodies
Asplundh Mfg. Div.
OME Inc.
Pac-Craft Prod.
Peabody Galion
Reading Body Works

Turf Blocks
Presto Products
Turfgrass Prod. Corp.

Vacuums
Allegretti & Company
Allis-Chalmers
Central Eng. Co.
Cobey Waste Control
Echo Inc.
E Z Rake Inc.
Giant Vac Mfg. Co.
Grasshopper Co.
Haul-All
Lambert Corp.
Mr. Air Sweepers
Parker Sweeper Co.
2. Equipment Companies

A & H Marketing
8525 Dru Ave. S.E.
Albuquerque, NM 87108
505-266-4821

Ace Pump Corp.
P.O. Box 13187
Memphis, TN 38113
901-948-8514

Acme Burgess Vibrocrafters Inc.
Grayslake, IL 60030
312-223-4821

Action Prod. Inc.
P.O. Box 164
Owings Mills, MD 21117
301-356-5055

Advanced Drainage System
3300 Riverside Dr.
Columbus, OH 43221
614-457-3051

Advanced Marketing, Inc.
Box 21036
Spokane, WA 99219
509-244-5508

Agtronics Mfg. Co.
756 Lakefield Rd., Suite C
Westlake Village, CA 91360
805-495-0874

Air-Lec Industries Inc.
3306 Commercial Ave.
Madison, WI 53714
608-244-4754

Air Technical Industries
7501 Clover Ave.
Mentor, OH 44060
216-951-5191

Aladdin Mfg., Blade Div.
620 S. 8th St.
Minneapolis, MN 55404

Algoa Net Co.
1525 Mueller St.
Algoma, WI 54201
414-487-5577

All American Outdoor Seating
1021 W. Broadway
Council Bluffs, IA 51501

Alllegretti & Company
9200 Mason Avenue
Chatsworth, CA 91511
213-341-4800

Allen-Clark Equip. Co.
121 Bester St.
Hagerstown, MD 21740

Allied Farm Equip.
P.O. Box 340, 1508 Maple Ave.
Belvidere, IL 61008

American Garden Cole
30627 Orr Rd.
Circleville, OH 43113
614-477-1671

American Enka, Turftire Products
1934 N.E. 151st St.
Miami, FL 33162
305-947-4649

American Enka Co.
Enka, NC 28728
704-667-7668

American Garden Cole
30627 Orr Rd.
Circleville, OH 43113
614-477-1671

American Lincoln
1100 Haskins Rd.
Bowling Green, OH 43402

American Standard Co.
1 West St.
Plantsville, CT 06479
203-628-9643

American Water Broom Company
Dept. W, 2099 Liddell Dr., N.E.
Atlanta, GA 30324
404-266-1000

Ametek/Plymouth Prod.
502 Indiana Ave.
Sheboygan, WI 53081
414-457-9435

Appleton Elect. Co.
1701 Wellington Ave.
Chicago, IL 60657

Aquamarine Corp.
P.O. Box 616
Waukesha, WI 53187
414-547-0211

Aquatic Irrigation Systems
P.O. Box 5638,
1482 E. Valley Rd. #17
Santa Barbara, CA 93108

Architectural Area Lighting Co.
13901-B S. Carpentia
Santa Fe Springs, CA 90670

Archway Greenhouses
Box 246
Duck Hill, MS 38925

Ariens Co.
655 W. Ryan
Brillion, WI 54110

Armor Metal Prod.
Box 4609
Helena, MT 59601

Arps, Div. of Chromalloy
New Holstein, WI 53061

Asplundh Mfg. Div.
50 E. Hamilton St.
Chalfont, PA 18914
215-822-0542

7100 S. Grand Ave.
St. Louis, MO 63111
314-353-7800

Atlee Burpee Co.
300 Park Ave.
Warminster, PA 18974

Atwater Strong
Box 68
Atwater, OH 44201
216-947-2344
First thing you notice about the new Vermeer V-454 Trencher is the sound. It's different. It's a quiet machine, because it's built solid. No frills. Just hard-working iron.

Heavy-duty, electrically-welded, steel frame. Heaviest in its class! (But you expect that from Vermeer.) A 4-speed mechanical drive keeps it simple and keeps you operating. Four-wheel drive gives you the traction and versatility to "walk" onto virtually any job site.

Power? A 140 CID Ford gas engine (diesel optional). Rugged, but fuel-efficient. And, with a 20.5 gallon fuel tank you've got the power and capacity to dig all day without taking a break.

You'll also like the interchangeable digging attachments. No need to modify the power unit. Just switch and go. Up to 18 in. wide, 60" deep with the trencher. Or, up to 24 in. of cover depth with the plow. And with the front-end attachments to complete the job with one machine.

But the best news is the price! Right now you can own a Vermeer at a price that's competitive with almost every other machine in its class. That's right! The superior quality of a Vermeer... at a price you can afford.

Want more information? Fill out the instant-action coupon. The Diggin' Dutchman will send you the information you want within 48 hours. For immediate help, see your nearest Vermeer dealer. Or, call Toll-Free (800) 247-2347. In Iowa call collect at (515) 628-9333.

You CAN DIG IT WITH VERMEER

Please send complete information on:

- Vermeer V-454 Trencher
- Vermeer Vibratory Plows
- Vermeer Tree Spades

NAME
COMPANY
ADDRESS
CITY
STATE ZIP
PHONE

Vermeer
8809 New Sharon Road
Pella, Iowa 50219

Write 144 on reader service card
<table>
<thead>
<tr>
<th>Company Name</th>
<th>Address/Contact Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>Auburn Cons. Ind.</td>
<td>2100 S. J. St. Auburn, NE 68305</td>
</tr>
<tr>
<td>Randolph Austin Co.</td>
<td>P.O. Box 988 Manchaca TX 78652 512-282-1590</td>
</tr>
<tr>
<td>Auto Crane Co.</td>
<td>P.O. Box 45548 Tulsa, OK 74145</td>
</tr>
<tr>
<td>Avco, E-Z Flow</td>
<td>Coldwater, OH 45828 419-678-5396</td>
</tr>
<tr>
<td>Avcon Ind.</td>
<td>1006 W. 53rd St. N. Wichita, KS 67204</td>
</tr>
<tr>
<td>Aztec Development Co.</td>
<td>P.O. Box 3348 Orlando, FL 32802 305-849-6420</td>
</tr>
<tr>
<td>B.F.G. Supply Co.</td>
<td>13020 Kinsman Rd. Burton, OH 44021 216-834-1883</td>
</tr>
<tr>
<td>Bocker Products Co.</td>
<td>Industrial Park Fort Washington, PA 19034 215-646-8446</td>
</tr>
<tr>
<td>Belson Mfg. Co.</td>
<td>N. Aurora, IL 60542 312-897-8489</td>
</tr>
<tr>
<td>Ben Meadows</td>
<td>3589 Broad St., P.O. Box 80549 Atlanta, GA 30341</td>
</tr>
<tr>
<td>Bennington Tractor Co.</td>
<td>706 Alpha Drive Cleveland, OH 44143 216-449-5816</td>
</tr>
<tr>
<td>Berkeley Pump Co.</td>
<td>P.O. Box 2007 Berkeley, CA 94710</td>
</tr>
<tr>
<td>Bernhard Export</td>
<td>Bilton Road Rugby, Eng. CV22 7TD 0788 811500</td>
</tr>
<tr>
<td>Beseler Tree Moving Equip.</td>
<td>5417 Oak Lawn Ave. Minneapolis, MN 55424</td>
</tr>
<tr>
<td>Big John Tree Transplanter Co.</td>
<td>Box 608 Heber Springs, AR 72543 501-362-8161</td>
</tr>
<tr>
<td>Big Toys</td>
<td>3113 S. Pine St. Tacoma, WA 98409</td>
</tr>
<tr>
<td>Big Trees Today Inc.</td>
<td>5362 Clarice Circle Stevens Pt. WI 54481 715-341-2895</td>
</tr>
<tr>
<td>Bil-Jax Inc.</td>
<td>Archbold, OH 43502 714-828-7155</td>
</tr>
<tr>
<td>Billy Goat Ind.</td>
<td>P.O. Box 308 Lees Summit, MO 64063</td>
</tr>
<tr>
<td>Black &amp; Decker Mfg. Co.</td>
<td>701 E. Joppa Rd. Towson, MD 21204</td>
</tr>
<tr>
<td>Blasius Electric Truck, Inc.</td>
<td>2550 Lullaby Ln. Anaheim, CA 92804 714-828-7155</td>
</tr>
<tr>
<td>Bluebird International</td>
<td>2778 S. Tejon Englewood, CO 80110 303-781-4458</td>
</tr>
<tr>
<td>Blue John Co.</td>
<td>P.O. Box 1607 Huntsville, AL 35807</td>
</tr>
<tr>
<td>Blue Valley Ind.</td>
<td>Box 205 Mexico, PA 17056</td>
</tr>
<tr>
<td>Bock Ind. Inc.</td>
<td>57540 State Rd. 19 S. Elkhart, IN 46514 219-235-8070</td>
</tr>
<tr>
<td>Bollens Div. FMC Corp.</td>
<td>215 S. Park Fort Washington, WI 53974 800-447-4700</td>
</tr>
<tr>
<td>Bomford &amp; Evershed Ltd.</td>
<td>Salford Priors Eversham, England WR11 5SW 0788-88-3383</td>
</tr>
<tr>
<td>Boss Mfg. Co.</td>
<td>221 W. First St. Kewanee, IL 61443 309-852-2131</td>
</tr>
<tr>
<td>Bowie Industries, Inc.</td>
<td>P.O. Box 931 Bowie, TX 76230 817-872-2286</td>
</tr>
<tr>
<td>Briggs &amp; Stratton Corp.</td>
<td>Box 702 Milwaukee, WI 53201</td>
</tr>
<tr>
<td>Brillen Iron Works</td>
<td>7200 Park Ave. Brillion, WI 54110 414-756-2121</td>
</tr>
<tr>
<td>Brinly-Hardy Co.</td>
<td>P.O. Box 1116 Louisville, KY 40201 502-585-3351</td>
</tr>
<tr>
<td>Buffalo Turbine Ag. Equip.</td>
<td>Gowanda, NY 14070 716-532-2272</td>
</tr>
<tr>
<td>Bunton Co.</td>
<td>4303 Poplar Level Rd. Louisville, KY 40213 502-459-3810</td>
</tr>
<tr>
<td>Burch Mfg. Co.</td>
<td>618 First Ave. N. Fort Dodge, IA 50501 515-573-4136</td>
</tr>
<tr>
<td>Bush Hog Implementos</td>
<td>Box 1039 Selma, AL 36707</td>
</tr>
<tr>
<td>Carlson Co.</td>
<td>P.O. Box 1465 Madison, WI 53701 608-849-5166</td>
</tr>
<tr>
<td>Caretree Systems</td>
<td>7030 D Huntley Rd. Columbus, OH 43229 614-846-2665</td>
</tr>
<tr>
<td>Camac Industries</td>
<td>27 Dwight Place Fairfield, NJ 07006 201-575-1831</td>
</tr>
<tr>
<td>Caretwee Systems</td>
<td>7030 D Huntley Rd. Columbus, OH 43229 614-846-2665</td>
</tr>
<tr>
<td>Carlson Co.</td>
<td>P.O. Box 1465 Madison, WI 53701 608-849-5166</td>
</tr>
<tr>
<td>Company Name</td>
<td>Address</td>
</tr>
<tr>
<td>-------------------------------------------</td>
<td>--------------------------</td>
</tr>
<tr>
<td>Cascade Corp.</td>
<td>P.O. Box 20187</td>
</tr>
<tr>
<td>Caterpillar Tractor Co.</td>
<td>100 N.E. Adams St.</td>
</tr>
<tr>
<td>Cat Pumps Corp.</td>
<td>1600 Freeway Blvd. North</td>
</tr>
<tr>
<td>Cedar Forest Products Co.</td>
<td>Polo, IL 61064</td>
</tr>
<tr>
<td>Central Eng. Co.</td>
<td>4429 W. State St.</td>
</tr>
<tr>
<td>Central Quality Industries, Inc.</td>
<td>900 S. Division</td>
</tr>
<tr>
<td>Centrecon Inc.</td>
<td>P.O. Box 28</td>
</tr>
<tr>
<td>Century Engr.</td>
<td>221 4th Ave. SE</td>
</tr>
<tr>
<td>Century Rain-Aid</td>
<td>31691 Dequindre Ave.</td>
</tr>
<tr>
<td>Chadwick Mfg. Co.</td>
<td>P.O. Box 58</td>
</tr>
<tr>
<td>Chamberlain Mfg. Corp.</td>
<td>845 Larch Ave.</td>
</tr>
<tr>
<td>Champion Sprayer Co.</td>
<td>6509 Heintz Ave.</td>
</tr>
<tr>
<td>Champion Sprinkler Equip.</td>
<td>1460 N. Naud St.</td>
</tr>
<tr>
<td>Champion Turf Equip.</td>
<td>318 W. 79th St.</td>
</tr>
<tr>
<td>Chapin Mfg. Works</td>
<td>29 Liberty St.</td>
</tr>
<tr>
<td>Chapin Watermatics, Inc.</td>
<td>Box 298</td>
</tr>
<tr>
<td>Chipmore Mfg. Co.</td>
<td>Box 671</td>
</tr>
<tr>
<td>Clinton Engines Corp.</td>
<td></td>
</tr>
<tr>
<td>Columbia Cascade Timber Co.</td>
<td>1975 S.W. 5th Ave.</td>
</tr>
<tr>
<td>Consolidated Pipe &amp; Tube</td>
<td>P.O. Box 191</td>
</tr>
<tr>
<td>Clean-Flo Laboratories, Inc.</td>
<td>P.O. Box 6797</td>
</tr>
<tr>
<td>Clegg, S.E. Nursery Equip. Co.</td>
<td>P.O. Box 252</td>
</tr>
<tr>
<td>Clements Associates, Inc.</td>
<td>P.O. Box 398</td>
</tr>
<tr>
<td>Clinton Engines Corp.</td>
<td></td>
</tr>
<tr>
<td>Columbia Cascade Timber Co.</td>
<td>1975 S.W. 5th Ave.</td>
</tr>
<tr>
<td>Consolidated Pipe &amp; Tube</td>
<td>P.O. Box 191</td>
</tr>
<tr>
<td>Central Eng. Co.</td>
<td>4429 W. State St.</td>
</tr>
<tr>
<td>Central Quality Industries, Inc.</td>
<td>900 S. Division</td>
</tr>
<tr>
<td>Centrecon Inc.</td>
<td>P.O. Box 28</td>
</tr>
<tr>
<td>Century Engr.</td>
<td>221 4th Ave. SE</td>
</tr>
<tr>
<td>Century Rain-Aid</td>
<td>31691 Dequindre Ave.</td>
</tr>
<tr>
<td>Chadwick Mfg. Co.</td>
<td>P.O. Box 58</td>
</tr>
<tr>
<td>Chamberlain Mfg. Corp.</td>
<td>845 Larch Ave.</td>
</tr>
<tr>
<td>Champion Sprayer Co.</td>
<td>6509 Heintz Ave.</td>
</tr>
<tr>
<td>Champion Sprinkler Equip.</td>
<td>1460 N. Naud St.</td>
</tr>
<tr>
<td>Champion Turf Equip.</td>
<td>318 W. 79th St.</td>
</tr>
<tr>
<td>Chapin Mfg. Works</td>
<td>29 Liberty St.</td>
</tr>
<tr>
<td>Chapin Watermatics, Inc.</td>
<td>Box 298</td>
</tr>
<tr>
<td>Chipmore Mfg. Co.</td>
<td>Box 671</td>
</tr>
<tr>
<td>Clark Equip. Co.</td>
<td>112 N. University Dr.</td>
</tr>
<tr>
<td>Clean-Flo Laboratories, Inc.</td>
<td>4342 Shady Oak Rd.</td>
</tr>
<tr>
<td>Clean City Squares</td>
<td>P.O. Box 6797</td>
</tr>
<tr>
<td>Clegg, S.E. Nursery Equip. Co.</td>
<td>P.O. Box 252</td>
</tr>
<tr>
<td>Clements Associates, Inc.</td>
<td>P.O. Box 398</td>
</tr>
<tr>
<td>Clinton Engines Corp.</td>
<td></td>
</tr>
<tr>
<td>Columbia Cascade Timber Co.</td>
<td>1975 S.W. 5th Ave.</td>
</tr>
<tr>
<td>Consolidated Pipe &amp; Tube</td>
<td>P.O. Box 191</td>
</tr>
</tbody>
</table>

**SUBSCRIBE TODAY!**

If you’re one of our thousands of ‘pass along’ readers, consider ordering your own personal subscription . . . Begin building your personal reference library of valuable technical and professional information today!

- **1 yr.** $14.00
- **2 yrs.** $24.00
- Bill me
- Payment enclosed
- Foreign prices slightly higher

Name ____________________________  
Title ____________________________  
Company Name ____________________  
Address __________________________  
City _____________________________  
State ____________________________  Zip ______

Business/Industry Description: (Such as lawn service, cemetery, PCO, etc.)________________________

Send to: Rosalie Slusher/Circulation Manager  
WEEDS TREES & TURF  
9800 Detroit Ave., Cleveland, OH 44102

---

**NOW**

- Combat Nutrient Stress
- Treat for Insect Pests

**Safe, Easy, Systemic!**

**EASY-TO-APPLY ENCAPSULATED IMPLANTS THAT WORK SYSTEMICALLY INSIDE THE TREE!**

**MEDICAPS** are the treatment of choice for chlorosis and other nutrient stress. Available in iron, zinc and manganese formulations plus new multi-nutrient **MEDICAP MD**.

**ACECAPS** contain orthene® a "new generation" insecticide for environmentally acceptable control of many destructive tree pests.

ACECAP® Copyright 1979 Creative Sales, Inc. MEDICAP Registered Trademark Creative Sales, Inc. (ORTHENE is the registered trademark of Chevron Chemical Company for acephate)
## Equipment Companies

**Continued**

<table>
<thead>
<tr>
<th>Company Name</th>
<th>Address</th>
<th>Phone Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Equipment Companies</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Construction Techniques Inc.</td>
<td>Cleveland, OH</td>
<td></td>
</tr>
<tr>
<td>Continental Belton Co.</td>
<td>P.O. Box 660, Belton, TX 76513</td>
<td>817-939-3731</td>
</tr>
<tr>
<td>Conwed Corp.</td>
<td>P.O. Box 43237, St. Paul, MN 55164</td>
<td>612-221-1260</td>
</tr>
<tr>
<td>Continental Custom Bridge</td>
<td>Route 5, Box 178, Alexandria, MN 56308</td>
<td></td>
</tr>
<tr>
<td>Continental  Custom  Bridge</td>
<td>Route 5, Box 178, Alexandria, MN 56308</td>
<td></td>
</tr>
<tr>
<td>Corwed Corp.</td>
<td>P.O. Box 43237, St. Paul, MN 55164</td>
<td>612-221-1260</td>
</tr>
<tr>
<td>Correct Mfg. Corp.</td>
<td>London Road Extension, Delaware, OH 43015</td>
<td>614-363-1951</td>
</tr>
<tr>
<td>Crane, Howard Inc.</td>
<td>Box 88, Oneida-Rome Rd., Oneida, NY 13421</td>
<td></td>
</tr>
<tr>
<td>Crutcher Bldg. Systems</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cushman OMC-Lincoln</td>
<td>P.O. Box 82409, Lincoln, NE 68501</td>
<td>402-484-7300</td>
</tr>
<tr>
<td>Cyclone Seeder Co.</td>
<td>P.O. Box 68, Urbana, IL 61803</td>
<td>219-774-3339</td>
</tr>
<tr>
<td>D. B. Smith &amp; Co.</td>
<td>414 Main St., Utica, NY 13503</td>
<td>315-775-5223</td>
</tr>
<tr>
<td>Danuser Machine Co.</td>
<td>537 E. 3rd St., Fulton, MO 65251</td>
<td></td>
</tr>
<tr>
<td>Dayco Corp.</td>
<td>333 W. First St., Dayton, OH 45402</td>
<td></td>
</tr>
<tr>
<td>Dayni Controls Mfg. Co.</td>
<td>18414 Eddy St., Northridge, CA 91325</td>
<td>213-349-8367</td>
</tr>
<tr>
<td>Dayton Electric Mfg. Co.</td>
<td>5959 W. Howard St., Chicago, IL 60646</td>
<td>312-647-8900</td>
</tr>
<tr>
<td>Decratrend</td>
<td>251 Mason Way, City of Industry, CA 91746</td>
<td></td>
</tr>
<tr>
<td>Dedoes Ind. Inc.</td>
<td>1060 W. Maple Rd., Walled Lake, MI 48080</td>
<td>313-624-7710</td>
</tr>
<tr>
<td>Deep Root Corp.</td>
<td>7354 Bolsa Ave., Westminster, CA 92683</td>
<td></td>
</tr>
<tr>
<td>Deimarva Textile Co., Inc.</td>
<td>254 N. Rehoboth Blvd., Milford, DE 19963</td>
<td>302-422-7531</td>
</tr>
<tr>
<td>Delta Foremost</td>
<td>3915 Air Park St., Memphis, TN 38130</td>
<td>901-363-4340</td>
</tr>
<tr>
<td>Del Zotto Mfg. Inc.</td>
<td>2300 Commonwealth Ave., Duluth, MN 55808</td>
<td>218-626-2781</td>
</tr>
<tr>
<td>Delavan Corp.</td>
<td>P.O. Box 100, W. Des Moines, IA 50265</td>
<td></td>
</tr>
<tr>
<td>Delco Remy, Div. GM</td>
<td>2401 Columbus Ave., Anderson, IN 46011</td>
<td></td>
</tr>
<tr>
<td>Dema Engr. Co.</td>
<td>10020 Big Bend Blvd., St. Louis, MO 63122</td>
<td></td>
</tr>
<tr>
<td>Derby Tiller Co.</td>
<td>P.O. Box 21, Rumson, NJ 07760</td>
<td></td>
</tr>
<tr>
<td>Dethmers Mfg. Co.</td>
<td>P.O. Box 189, Boyd, IA 51234</td>
<td>712-725-2302</td>
</tr>
<tr>
<td>Detjen Corp. Insectocuter Div.</td>
<td>Box 150, Salt Point Turnpike, Clinton Corners, NY 12514</td>
<td>194-266-3150</td>
</tr>
<tr>
<td>Detroit Diesel Allison, Div. GMC</td>
<td>13400 W. Outer Dr., Detroit, MI 48228</td>
<td>313-424-4960</td>
</tr>
<tr>
<td>Didier Mfg.</td>
<td>8630 Industrial Dr., Franksville, WI 53126</td>
<td>414-886-0525</td>
</tr>
<tr>
<td>Digital Equip. Corp.</td>
<td>444 Whitney St., Northboro, MA 01532</td>
<td></td>
</tr>
<tr>
<td>Ditch Witch Div., Charles Machine</td>
<td>P.O. Box 66, Perry, OK 73077</td>
<td>800-654-6481</td>
</tr>
<tr>
<td>Dobbins Inc.</td>
<td>P.O. Box 1870 A, Garden Grove, CA 92642</td>
<td>714-539-2281</td>
</tr>
<tr>
<td>Dountz Equip. Co.</td>
<td>1437 E. 6th Ave., Columbus, OH 43219</td>
<td></td>
</tr>
<tr>
<td>Dover Corp.</td>
<td>Blackmer Pump Div., 1809 Century Ave. S.W.</td>
<td></td>
</tr>
<tr>
<td>Grand Rapids, MI 49509</td>
<td>616-241-1611</td>
<td></td>
</tr>
<tr>
<td>Dredgeast, Inc.</td>
<td>P.O. Box 206, New Canaan, CT 06840</td>
<td>203-972-0701</td>
</tr>
<tr>
<td>Drip-Eze</td>
<td>P.O. Box X, El Cajon, CA 92022</td>
<td></td>
</tr>
<tr>
<td>Drip-Ignition Co.</td>
<td>P.O. Box 400 McArthur Dr., North Little Rock, AK 72118</td>
<td>501-758-3695</td>
</tr>
<tr>
<td>Durnell Engineering Inc.</td>
<td>Broadway (Hwy. 4) S., Emmetsburg, IA 50536</td>
<td></td>
</tr>
<tr>
<td>Dynamic Industries Inc.</td>
<td>Box 466, Barnsainsville, MN 56514</td>
<td>800-346-4858</td>
</tr>
<tr>
<td>ESB Inc.</td>
<td>101 Gibraltra Horsham, PA 19044</td>
<td>215-674-9500</td>
</tr>
<tr>
<td>E-Z-Go, Div. of Textron</td>
<td>1225 N. Ct. Rd. 18, Minneapolis, MN 55427</td>
<td>612-542-0516</td>
</tr>
<tr>
<td>E-Z Rake Inc.</td>
<td>P.O. Box 506, Lebanon, IN 46052</td>
<td>317-482-1662</td>
</tr>
<tr>
<td>Echo Inc.</td>
<td>3150 MacArthur Dr., Northbrook, IL 60062</td>
<td>312-291-2800</td>
</tr>
<tr>
<td>Ecor Spray Systems Div.</td>
<td>2820 Electronic Dr., Melbourne, FL 32935</td>
<td>305-254-0923</td>
</tr>
<tr>
<td>Edmont-Wilson</td>
<td>2568 Walnut St., Coshocton, OH 43812</td>
<td></td>
</tr>
<tr>
<td>Edwards Equip. Co.</td>
<td>4312 Main St., Yakima, WA 98903</td>
<td></td>
</tr>
<tr>
<td>Enclosures Inc.</td>
<td>80 Main St., Moreland, GA 30259</td>
<td></td>
</tr>
<tr>
<td>Engineered Products Co.</td>
<td>2021 MacArthur Road, Waukesha, WI 53186</td>
<td>414-547-5558</td>
</tr>
<tr>
<td>Erickson Corp.</td>
<td>211 St. Anthony Pkwy. NE Minneapolis, MN 55418</td>
<td>612-789-8811</td>
</tr>
<tr>
<td>Eversman Mfg. Co.</td>
<td>Dept. SM 12/Box 4345, Denver, CO 80204</td>
<td></td>
</tr>
<tr>
<td>Excel Industries</td>
<td>P.O. Box 727, Hesston, KS 67062</td>
<td></td>
</tr>
</tbody>
</table>
There's just one name on top of the underground now...J I Case! With the tough Case DH-series trenchers DH4, DH5, DH5 Quad and DH7.

Total hydrostatics are the heart of every DH trencher. A new hydrostatic trencher drive permits infinitely variable digging chain speeds ... plus reverse. With a DH trencher, the engine operates at optimum RPM... so you don't have to lug it down to match chain speed or soil conditions. That means more efficiency. And greater fuel economy.

Diesel power comes standard with each DH trencher. The rugged liquid-cooled diesels are coupled to twin closed-loop hydrostatic systems to assure a constant source of power. One for ground drive, one for attachments. You've always got plenty of "live" action.

Built-in versatility gives every DH trencher more job capability. The trencher, backhoe and blade can be mounted on either end. So you can build your DH trencher just the way you need it. Articulation and hydrostatic ground drive give DH trenchers stability and traction. And the Case Mono-Stick makes operation easy... just push the direction you want to go.

The new Case DH4, DH5, DH5 Quad and DH7. See them soon at a Case Trencher Dealer near you. And put yourself on top of the underground!

J I Case
A Tenneco Company
Light Equipment Division
PO Box 9228 Wichita, KS 67277 U.S.A.

Write 138 on reader service card
Equiment Companies continued

316-327-4911
800-835-3260

F. E. Myers Co.
400 Orange St.
Ashland, OH 44805
419-322-1544

FD Kees Mfg. Co.
700 Park Ave.
Beatrice, NE 68310
402-223-4303

633 Monroe St.
Sheboygan Falls, WI 53085
414-467-6167

Ferguson Welding & Spring, Inc.
25170 W. Edison Rd.
South Bend, IN 46628
219-234-4303

Fert-O-Ject
4701 Old San Jose Rd.
Santa Cruz, CA 95065

Fiberglass Unlimited, Inc.
South Highway 81
Watertown, SD 57201
605-886-5137

Finn Equip. Co.
2525 Duck Creek Rd.
Cincinnati, OH 45208
1-800-543-7166

Firestone Tire Co.
1200 Firestone Pkwy.
Akron, OH 44317
216-379-7000

Flexitube Int. Corp.
Box 292
Willowgrove, PA 19090
215-674-8036

Flo Control Inc.
3212 Winona Ave.
Burbank, CA 91503

Florian Pruners
797 Mott Hill Rd.
S. Glastonbury, CT 06073

Flotec Inc.
2525 Duck Creek Rd.
Cincinnati, OH 45208
1-800-543-7166

The Flymo Co.
13400 Northrup Way
27, Issaquah, WA 98027
206-649-2720

5601 E. Highland Dr.
Jonesboro, AR 72401
501-935-1970

FMC Corp., Bolens
215 S. Park St.
Port Washington, WI 53074

FMC, Sweeper Div.
1201 E. Lexington St., Box 2547
Pomona, CA 91766
714-629-4071

Foley Mfg. Co.
3300 5th St. N.E.
Minneapolis, MN
800-328-7140

Ford Motor Co., Tractor Operations
2500 E. Maple Rd.
Troy, MI 48084
313-643-2000

Fox Valley Marking Systems
172 South N.W. Highway
Gary, IL 60033
312-639-5744

Francesville Drain Tile Corp.
Francesville, IN 47946
219-567-9133

Friend Mfg. Corp.
Gasport, NY 14067
716-772-2622

Fuerst Brothers Inc.
Rheineck, NY 12572
914-876-3575

Game Time Inc.
P.O. Box 121
Fort Payne, AL 35967
205-845-5610

Gandy Co.
528 Gandrud Rd.
Owatonna, MN 55060
507-451-5430

General Bandages Inc.
8300 LeHigh Ave.
Morton Grove, IL 60053
312-966-8383

General Electric Co.
Dept. 1180, Nela Park
Cleveland, OH 44112

General Irrigation Co.
P.O. Box 776
Carthage, MO 64836

General Tire & Rubber
1 General St.
Akron, OH 44329

Gerber Mfg. Inc.
P.O. Box 163
Middletown, WI 53562
608-271-2777

GF Plastic Systems Inc.
2882 Dow Ave.
Tustin, CA 92680
714-731-8800

Giant Mfg. Inc.
Council Bluffs, IA 51501

Giant Vac Mfg. Co.
Box 15214
Charlotte, NC 28210

Gilson Bros.
Box 152
Plymouth, WI 53073

Glenmac, Inc.
P.O. Box 1398
Jamestown, ND 58401
800-437-9779

Global Irrigation Corp.
7341 Whittier Ave.
Whittier, CA 90602
714-522-7390

Goodall
1405 Bunton Rd.
Louisville, KY 40213

Gorman-Rupp Industries
Belleville, OH
419-886-3001

Granberg Ind.
200 S. Garrand Blvd.
Richmond, CA

Grasshopper Co.
P.O. Box 810
Moundridge, KS 67107
316-345-6304

Grass Pavers Ltd.
3807 Crocks Rd.
Royal Oak, MI 48073

Gravelly Tractor Inc.
3505 Gravelly Ln.
Clemmons, NC 27012

Gray Mfg. Co.
1316 Frederick Ave.
St. Joseph, MO 64501

Greenfield Traveling Sprinklers
P.O. Box 5695
Lubbock, TX 79417
806-763-9591

Green Hoe Co., Inc.
West Main Rd.
Portland, NY 14769
716-792-9433

Green Manufacturing, Inc.
P.O. Box 408
Bowling Green, OH 43402
419-353-5231

Griswold Controls
Box 19612
Irving, CA 92713

Ground Hog Inc.
P.O. Box 290
San Bernadino, CA 92402

Gruender Co.
2915 N. Market St.
St. Louis, MO 63106
314-531-1220

GTE Sylvania
100 Endicott St.
Danvers, MA 01923
617-777-1900

Guest Industries Inc.
3601 Winsted Rd.
Torrington, CT 06790
203-482-1118

Gustafson Mfg. Co. Inc.
P.O. Box 4188
Corpus Christi, TX 78408
512-882-4025
<table>
<thead>
<tr>
<th>Equipment Companies</th>
<th>Address</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>International Spike</strong></td>
<td>P.O. Box 1750, Lexington, KY 40593</td>
</tr>
<tr>
<td><strong>Irrometer Co., Inc.</strong></td>
<td>P.O. Box 2424, Riverside, CA 92516</td>
</tr>
<tr>
<td><strong>Jaeco Pump Co.</strong></td>
<td>539 Ford St., West Conshohocken, PA 19428</td>
</tr>
<tr>
<td><strong>J. A. Nearing Co.</strong></td>
<td>9390 Davis Ave, Laurel, MD 20810</td>
</tr>
<tr>
<td><strong>JCB Inc.</strong></td>
<td>10939 Philadelphia Rd., White Marsh, MD 21162</td>
</tr>
<tr>
<td><strong>J. E. Burke Co.</strong></td>
<td>Fond du Lac, WI 54935</td>
</tr>
<tr>
<td><strong>J.I. Case</strong></td>
<td>700 State St., Racine, WI 53404</td>
</tr>
<tr>
<td><strong>J.I. Case, Davis Div.</strong></td>
<td>P.O. Box 1801, Wichita, KS 67201</td>
</tr>
<tr>
<td><strong>JLG Industries, Inc.</strong></td>
<td>JLG Drive, McConnellsburg, PA 17233</td>
</tr>
<tr>
<td><strong>Jacobsen Mfg. Co., Div.</strong></td>
<td>1721 Packard Ave, Racine, WI 53403</td>
</tr>
<tr>
<td><strong>Jamison Inc.</strong></td>
<td>8800 Mettler St., Los Angeles, CA 90003</td>
</tr>
<tr>
<td><strong>John Deere &amp; Co.</strong></td>
<td>John Deere Rd., Moline, IL 61265</td>
</tr>
<tr>
<td><strong>Johns-Manville</strong></td>
<td>Johns-Manville, Buckner P.O. Box 232, Fresno, CA 93708 209-442-8511</td>
</tr>
<tr>
<td><strong>K-D Mfg. Co.</strong></td>
<td>1840 Australian Ave., Riviera Beach, FL 33404 305-844-1002</td>
</tr>
<tr>
<td><strong>Kawasaki Motors Corp.</strong></td>
<td>650 Valley Park Dr., Shakopee, MN 55379</td>
</tr>
<tr>
<td><strong>Kel Instruments Co., Inc.</strong></td>
<td>P.O. Box 1869, Clifton, NJ 07015 201-471-3954</td>
</tr>
<tr>
<td><strong>KEM Enterprises</strong></td>
<td>2309-A S. Tacoma Way, Tacoma, WA 98409 206-473-3770</td>
</tr>
<tr>
<td><strong>Kembro</strong></td>
<td>Box 205, Mequon, WI 53092 414-242-2630</td>
</tr>
<tr>
<td><strong>Kenyon Manufacturing Inc.</strong></td>
<td>1145 W. Barkley Ave, Orange, CA 92667 714-634-3422</td>
</tr>
<tr>
<td><strong>Kershaw Mfg. Co.</strong></td>
<td>Box 9328, Montgomery, AL 36108</td>
</tr>
<tr>
<td><strong>Keystone Group</strong></td>
<td>7000 South West Adams St., Peoria, IL 61641</td>
</tr>
<tr>
<td><strong>King Bros. Ind.</strong></td>
<td>27114 Henry Mayo Dr., Valencia, CA 91355 805-257-3262</td>
</tr>
<tr>
<td><strong>Koehring Co.</strong></td>
<td>P.O. Box 1279, Appleton, WI 54912</td>
</tr>
<tr>
<td><strong>Kohler Co.</strong></td>
<td>Kohler, WI 53044 414-457-4441</td>
</tr>
<tr>
<td><strong>Komatsu Forklift (U.S.A.) Inc.</strong></td>
<td>P.O. Box 947, La Mirada, CA 90637 414-739-3631</td>
</tr>
<tr>
<td><strong>Koppers Co. Inc.</strong></td>
<td>1900 Koppers Bldg., Pittsburgh, PA 15219</td>
</tr>
<tr>
<td><strong>Korex Ind.</strong></td>
<td>51 El Pueblo Dr., Scotts Valley, CA 95066</td>
</tr>
<tr>
<td><strong>Kraft Inc.</strong></td>
<td>135 N. Caseville Rd., Pigeon, MI 48755 517-453-3641</td>
</tr>
<tr>
<td><strong>Kubota Tractor Corp.</strong></td>
<td>550 W. Artesia Blvd., Compton, CA 90220 213-537-2531</td>
</tr>
<tr>
<td><strong>Kut-Kwic Corp.</strong></td>
<td>P.O. Box 984, Brunswick, GA 31520</td>
</tr>
<tr>
<td><strong>Kwik-Bilt Inc.</strong></td>
<td>3114 Benton St., Garland, TX 75042 214-494-1164</td>
</tr>
<tr>
<td><strong>LaFont Corp.</strong></td>
<td>1319 Town St., Prentice, WI 54556 715-428-2881</td>
</tr>
<tr>
<td><strong>L. A. Steelcraft Prod.</strong></td>
<td>1974 Lincoln Ave., Pasadena, CA 91103</td>
</tr>
<tr>
<td><strong>L. B. Foster</strong></td>
<td>415 Holiday Dr., Pittsburgh, PA 15220</td>
</tr>
<tr>
<td><strong>La Motte Chemical</strong></td>
<td>Box 329, Chestertown, MD 21620 301-778-3100</td>
</tr>
<tr>
<td><strong>Lakeshore Equip. &amp; Supply</strong></td>
<td>300 S. Abbe Rd., Elyria, OH 44035</td>
</tr>
<tr>
<td><strong>Lambert Corp.</strong></td>
<td>519 Hunter Ave., Dayton, OH 45404 513-223-7295</td>
</tr>
<tr>
<td><strong>Landscape Forms</strong></td>
<td>Rt. 3, Kalamazoo, MI 49001</td>
</tr>
<tr>
<td><strong>Landscape Structures Inc.</strong></td>
<td>300 Dawn Heather Dr., Delano, MN 55328 612-972-3391</td>
</tr>
<tr>
<td><strong>Langco Ltd.</strong></td>
<td>P.O. Box 550, Bridgeport, CT 06604 203-366-3701</td>
</tr>
<tr>
<td><strong>Larson Machine Inc.</strong></td>
<td>Princeville, IL 61559 309-385-4312</td>
</tr>
<tr>
<td><strong>Claude Laval Corp., Lakos Separators</strong></td>
<td>1911 N. Helm, Fresno, CA 93727 209-255-1601</td>
</tr>
<tr>
<td><strong>Lawn-Boy</strong></td>
<td>Div. of Outboard Marine Co., Galesburg, IL 61401 309-343-0141</td>
</tr>
<tr>
<td><strong>Lawn Pro</strong></td>
<td>1111 S. Alpine, Rockford, IL 61108 815-397-9367</td>
</tr>
<tr>
<td><strong>Lawnmaker Mfg. Co.</strong></td>
<td>Box 871, Bay City, MI 48707 517-894-4578</td>
</tr>
<tr>
<td><strong>Leisure Lawn Inc.</strong></td>
<td>765 Liberty Lane, Dayton, OH 45449</td>
</tr>
<tr>
<td><strong>Lewis Systems</strong></td>
<td>22911 Montgomery St., Watertown, WI 53094 414-261-3162</td>
</tr>
<tr>
<td><strong>Levco Mfgs., Inc.</strong></td>
<td>PO Drawer L., Wynne, AR 72396 501-238-8126</td>
</tr>
<tr>
<td><strong>Life-Time Prod.</strong></td>
<td>Box 465, Kewanee, IL 61443 309-853-3387</td>
</tr>
<tr>
<td><strong>Lindig Mfg. Corp.</strong></td>
<td>1875 W. County Rd. C., St. Paul, MN 55113 612-633-3072</td>
</tr>
</tbody>
</table>
We’ve told you about our LESCOSAN, about our 100% Sulfur-Coated Fertilizers, about Lesco CBS Certified Ryegrass Blend and our complete turf-line.

You know our products, get to know our people.
Lakeshore is proud of its personalized service. You get that service over the counter and on the phone with people like Jimmy Cochran and Joe Winland. In the accounting department you get that service from Ron Gore and from Dan Dunstan.

Lakeshore Sells Lescosan (Betasan*) and Lescosan has been selling itself to you for years. On lawns and on golf courses, Lescosan has proven itself a highly effective, efficient and economical pre-emergence control for crabgrass and Poa annua.

If you know Lescosan, you know about Lakeshore Equipment & Supply Co. We sell Lescosan and a complete line of high quality turf products, but our most important product is SERVICE.

*(Betasan — registered trademark of the Stauffer Chemical Company).

IN OHIO
800-362-7413

Lakeshore carries a complete horticulture line — chemicals, seed, fertilizer, golf course accessories — as well as irrigation systems and parts. Bob Hobar and Jack Bruns discuss sprinkler refinements here. Bob and Skip Burkhardt work to design an individualized system.
Meet the Lawn Care Team — Herb Cole, Ron Giffen, Bill Tanner, Art Wick, Harry Podvia, Lescosan and other LESCO Products including LESCO Sulfur-Coated Fertilizers.

Personal service keeps us growing. Lakeshore began 17 years ago as a small Ohio company. Now our Lescosan, our LESCO and other brand-name products are marketed nationwide.

At Lakeshore we take pride in our products, in our turf knowledge and in our ability to serve the needs of our customers. Need some Lescosan, a ChemLawn gun, some fertilizer, or a bedknife? Call us today. At Lakeshore we sell more than Lescosan. At Lakeshore we sell service.

NATIONWIDE
800-321-5325

LESCO Trucks make regular sales and delivery visits to over 3,000 golf courses and nurseries from Florida to Michigan. Although LESCO salesman Ed Williams is usually on the road with LESCO service, he stops back at the main office to restock and to discuss customer needs with Gene Probasco.
Lakeshore—a name you can count on for quality... quality products, quality service.

Supervisors like Ag Industries Mfg.'s (a subsidiary of Lakeshore Equipment & Supply Co.) Ron Smith and Dick Coleman formulate LESCO Sulfur-Coated Fertilizers with Lescosan at the Columbia, Alabama, facility. Facilities like our fertilizer plant in Columbia, Alabama, and our new warehouse planned for Wellington, Ohio, help make our service better.

Phil Gardner, a former golf course superintendent, studies his customers' needs carefully before recommending specific products. Phil is proud to be marketing LESCO Fertilizers and CBS Certified Ryegrass Blend.

Lakeshore supplies Lescosan, replacement parts, tee and green accessories and LESCO turf and horticulture supplies across the continental United States and even in Hawaii and Australia. And we believe each customer deserves personalized service.

You know the quality you can expect from Lescosan (Betasan*). That's the quality everyone at Lakeshore strives to put into each product we handle.

Warehouse employees like Chuck Douglas make certain the products get from the warehouse to you.

You know our products. If you don't know our people, get to know them—I think you'll like them.

Lakeshore is the turf company that got big by acting small. Started 17 years ago, Lakeshore now carries over 1,000 chemicals, grass seeds, replacement parts and golf course accessories. But a company is more than its product line. A company is the knowledge of the industry and products. A company is the attention of a salesman in tailoring a program to meet your needs. At Lakeshore we believe a company is as good as its service and its people. At Lakeshore we have good service and good people. Ask our 10,000 customers. You know the quality you can expect from Lescosan (Betasan*). That's the quality everyone at Lakeshore strives to put into each product we handle.

Phil Gardner, a former golf course superintendent, studies his customers' needs carefully before recommending specific products. Phil is proud to be marketing LESCO Fertilizers and CBS Certified Ryegrass Blend.

Lakeshore supplies Lescosan, replacement parts, tee and green accessories and LESCO turf and horticulture supplies across the continental United States and even in Hawaii and Australia. And we believe each customer deserves personalized service.

You know our products. If you don't know our people, get to know them—I think you'll like them.
Check out these energy savers from SOLO

SOLO's 426R riding mistblower is a rugged, lightweight 12.5-hp energy-saver for the fruit, berry, vegetable, or ornamental grower. Standard cleat or ATV tires.

PTO-driven 451/452 mistblowers cut hundreds of pounds from a tractor's load. 53, 80, or 105-gal. formula tanks available; centrifugal or piston pump. PLUS...both save money too. SOLO mistblowers give better coverage with lower volume...better than any sprayer!

• SAVE with 8-nozzle discharge, adjustable in direction, flow rate. Install TELEBLAST nozzle for 50-ft. radius coverage.
• SAFE no-drift herbicide application with optional spray boom or hand gun

Send for free brochure or ask your dealer for SOLO

Write 107 on reader service card
Equipment Companies

continued

McCulloch Corp.
P.O. Box 92180
Los Angeles, CA 90009

McDonough Power Equip.
535 Macon Rd.
McDonough, GA 30253
404-957-9141

McGraw Edison Co.
7601 Durand Ave.
Racine, WI 53406
414-554-8001

McGregor Greenhouses
1195 Thompson Ave.
Santa Cruz, CA 95063

Mechanical Transplanter Co.
1150 S. Central Ave.
Box 1008B
Holland, MI 49423
616-396-8738

Mec-O-Matic Co.
P.O. Box 43390
St. Paul, MN 55164
612-739-5330

Medalist Standard Steel
420 14th St.
Three Rivers, MI 49093
616-279-5211

Melnor Ind. Inc.
1 Carol Place
Moonachie, NJ 07074

Menardi Southern Corp.
P.O. Box 240
Augusta, GA 30903
404-724-8241

Meredit Seed Miser
Box 21
Howe, ID 83244
208-767-3411

Mexico Forge-Kilgore
P.O. Box 565
Reedsdale, PA 17084

10700 Sentinel Dr.
San Antonio, TX 78216
512-654-8570

Microdot Prod.
2530 Crescent Dr.
Broadview, IL 60153
312-343-9620

Micron West Inc.
8582 Katy Freeway
Houston, TX 77024

Midland Pump.
LFE Fluid Controls Div.
100 Skiff St.
Hamden, CT 66514
203-281-8000

Midwest Mfg. Co.
Kellgo, IA 50135

Millerbrnd Mfg. Co.
Winsted, MN 55395
612-465-2111

Milwaukee Electric Tool
13135 W. Liston Rd.
Brookfield, WI 53005

Mine Safety Appliance Co.
201 N. Braddock Ave.
Pittsburgh, PA 15208

Minnesota Warner Co.
5145 Eden Ave. S.
Minneapolis, MN 55436
612-929-1070

Miracle Recreation Equip.
Grinnell, IA 50112
515-236-7536

Mits & Merrill Inc.
109 McCosky St.
Saginaw, MI 48601

Mobile Aerial Towers Inc.
2314 Bowser Ave.
Fl. Wayne, IN 46803

Moody Sprinkler Co. Inc.
2121 S. Standard
Santa Ana, CA 92705
714-549-0464

Mobark Ind. Inc.
Box 1000
Winn, MI 48896
517-866-2381

Morrison Molded Fiberglass
P.O. Box 508
Bristol, VA 24201

Motorola
1301 E. Algonquin Rd.
Shaumburg, IL 60196

Mo-Trim Inc.
P.O. Box 827
Cambridge, OH 43725
614-439-2725

Mott Corp.
514 Shawmut Ave.
LaGrange, IL 60525
312-354-7220

Mud Cat Division
National Car Rental System
P.O. Box 16247
St. Louis Park, MN 55416
612-830-2475

Muscantine Lighting Mfg. Co.
2107 Stewart Rd.
Muscantine, IA 52761

N. American Rec. Conv.
P.O. Box 758
Bridgeport, CT 06601

N. P. Nelson
1301 Rt. 23
Butler, NJ 07405
201-838-0173

National Diversified Sales, Inc.
2550 Azure Circle
Newbury Park, CA 91320

National Greenhouse Co.
Box 100
Pana, IL 62557

National Hydro-Ax, Inc.
P.O. Box 568
Owatonna, MN 55060
507-451-8654

National Mower Co.
700 Raymond Ave.
St. Paul, MN 55114
612-646-4079

National Steel Prod. Co.
P.O. Box 40490
Houston, TX 77040

Nelson Irrigation Corp.
Rt. 4, Box 169
Walla Walla, WA 99362

Nelson LR Corp.
7719 N. Pioneer Ln.
Peoria, IL 61615

New and Unusual Products Co.
Box 1296
Edmond, OK 73034
405-478-1627

New Draulics, Inc.
2252 So. 3600 West
Salt Lake City, UT 84119

NFI, Inc.
6407 Masonic Dr.
Alexandria, LA 71301
318-487-8371

Nicelon Corp.
Baton Rouge, LA

Nordco Marketeer Corp.
P.O. Box 712
Redlands, CA 92373

Nordick Canadian R & D Ltd.
1044 Rangeview Rd.
Mississauga, Ont., CN L5E 1H3
416-278-3331

Northeast Industries, Inc.
301 Greenwood Ave.
Midland Park, NJ 07432
201-652-6202

Northeast Power Products Inc.
300 Greenwood Ave.
Midland Park, NJ 07432

2000 Plainfield Pike,
Cranston, RI 02920
401-943-4400
the grass is greener on your side with Bowie's HYDRO-MULCHER

For fast, easy turf establishment—the Bowie Hydro-Mulcher is the answer. The one-step operation of a Bowie Hydro-Mulcher plants, seeds, sprigs, fertilizes, waters, sprays and mulches. And with a Bowie Hydro-Mulcher, you can seed over three acres in fifteen minutes. That saves you valuable time and money! Order the Bowie Hydro-Mulcher—you'll have the best and greenest—on your side!

write for free catalog

BOWIE INDUSTRIES, INC.
P.O. Box 931 Bowie, Texas 76230 • (817) 872-2286

Preserve Your Copies of WEEDS, TREES & TURF in Permanent Binders
only $4.75

Custom-made binder easily holds entire year's copies of WTT magazine. Green binder with gold embossed logo protects your magazines and gives your library a neat appearance. Magazines can be inserted as they are received. Annual index in December issue makes it easy to find information you need quickly . . . Send check or money order to:

WEEDESTRSS&TURF
9800 Detroit Ave.
Cleveland, Ohio 44102
(Add $1.25 per Binder Shipping Chg.) Allow 3-4 Weeks Delivery.

Write 140 on reader service card
Equipment Companies

continued

Patterson-Williams
P.O. Box 4040
Santa Clara, CA 95054

Peabody Galion
Galion, OH 44833
419-468-2120

Peerless Equip. Corp.
5600 Old Spanish Trail
Houston, TX 77023

Pen-Gro Sales Co.
P.O. Box 2326
San Francisco, CA 94080

Pepco
10030 South Greenleaf Ave.
Santa Fe Springs, CA 90670
213-944-6171

P.O. Box 68
Greenville, AL 36037
205-382-3183

Piper Aircraft Corp.
820 Bald Eagle St.
Lock Haven, PA 17745

Piqua Engr. Inc.
Box 605
Piqua, OH 45356
513-775-2464

Pitman Mfg. Co.
P.O. Box 120
Grandview, MO 64030

Plant Production
Rt. 7 Box 441E
Fort Worth, TX 76119
817-478-0761

Plastech
John Fitch Ind. Pk.
Warminister, PA 18974

Plastic Omnium Inc.
70 Shawmut Rd.
Canton, MA 02021
617-828-3400

Playtime Equip. Corp.
Mars, PA 16046

Playworld Systems
315 Cherry St.
New Berlin, PA 17855

Poligon
P.O. Box 1112-B
Holland, MI 49423
616-398-1963

Poly-America Inc.
2000 W. Marshall Dr.
Grand Prairie, TX 75051
214-647-2950

Portableachers Inc.
Box 53
Lapeer, MI 48446

Power Lawn Mower Parts, Inc.
1920 Lyell Ave.
P.O. Box 7837, Lyell Station
Rochester, NY 14606

Power Spray Tech.
Sharion Hill, PA 19079

Precision Products, Inc.
2415 S. Grand Ave.
East Springfield, IL 62708
217-528-1311

Precision Valley Mfg. Co.
Chester Rd.
Springfield, VT 05156
802-885-5576

Preferred Security Components Inc.
1020 Stony Battery Rd.
Lancaster, PA 17601
717-898-0107

Presto Products
P.O. Box 767
Appleton, WI 54912
414-739-2204

Pringle Mfg. Co.
Rt. 4, Box 235
Walla Walla, WA 99362

Products For Energy, Inc.
4303-B Norman Bridge Rd., P.O. Box 2755
Montgomery, AL 36105
205-284-1411

Professional Turf Specialties
1801 Industrial Park Rd.
Normal, IL 61761
309-454-2467

Progressive Electronics Inc.
432 South Extension
Mesa, AZ 85202
602-834-4308

Promark Prod. Corp. of Ohio
P.O. Box 735
Norwalk, OH 44857
419-668-3721

Pumping Systems Inc.
P.O. Box 44153
Dallas, TX 75234

R & R Prod. Inc.
3334 E. Milber St.
Dallas, TX 75714
214-739-2101

Rain Bird
7045 N. Grand
Glendora, CA 91740
213-963-9311

Rain Jet Corp.
301 S. Flower St.
Burbank, CA 91503

Rain-O-Mat Sprinklers, Inc.
P.O. Box 151
Whittier, CA 90608
213-933-2721

Raindrift Inc.
4675 Titus
Panorama City, CA 91402
213-988-0303

Rainfair, Inc.
P.O. Box 1647
Racine, WI 53401
414-637-1201

Ram Ind.
125 N. 10th St.
Waukee, IA 50263

Rain Ind.
Box 1007
Sioux Falls, SD 57101
605-336-2750

Raverty's Sod Blades
P.O. Box 7606
St. Paul, MN 55119
612-774-2155

RCF Developments
2509 Browncliff Blvd.
Rochester, NY 14625

Reach-All Mfg.
436 Calvary Rd.
Duluth, MN 55803

Reading Body Works Inc.
Dept. 1163, Box 14
Reading, PA 19603
215-775-3301

Recreation Equip. Corp.
730 W. 8th St.
Anderson, IN 46011

Reliant
P.O. Box 584
Plainfield, NJ 07081
201-755-0921

Reliable Greenhouses
Box G, Rt. 53
Norwell, MA 02061

Rhino Sales Corp.
620 Andrews Ave.
P.O. Box 367
Kewanee, IL 61443
309-853-4461

Rhino by Athens & Servis, Austin Prod.
P.O. Box 22117
Dallas, TX 75222
214-651-0733

Richdel Inc.
1851 Oregon St.
Carson City, NV 58701
702-882-6786

68 WEEDS TREES & TURF/SEPTEMBER 1980
Pennwalt—
A commitment
to clean water
for over 20 years.

Put it to work
for your customers.

In more than two decades of commercial usage, Pennwalt aquatic herbicides have shown their effectiveness and compatibility with the environment, especially the ecological support systems of lakes, ponds, and streams.

Pennwalt aquatic herbicides kill water weeds and algae on contact*. And because these herbicides are based on a non-persistent compound—endothall—there is no bioaccumulation in the aquatic environment. Endothall breaks down in two weeks or less into carbohydrates—common constituents of plant life.

Pennwalt’s Aquathol K features a margin of safety to fish when properly applied, with little adverse effect on fish food organisms or the general ecosystem. Swimming can be permitted just 24 hours after treatment with Aquathol K or Aquathol Granular.

To fill all your needs, Pennwalt aquatic herbicides come in a variety of forms: AQUATHOL K Herbicide—in convenient liquid and granular forms. HYDROTHOL Herbicide/Algicide—in liquid and granular forms. HYDOUT Herbicide/Algicide*—pellet form. Clean up your customers’ water weed problems with the products that are backed by years of experience—Pennwalt aquatic herbicides. Interested in serving the aquatics business as an applicator? Let us help you with complete educational and technical support. Write or call for further information: Pennwalt Corporation, 1630 E. Shaw Avenue, Suite 179, Fresno, California 93720.

* Consult the label for species controlled and rates required.
** HYDOUT is available as a Special Local Needs registration in Florida, Alabama, Texas and Georgia.

Write 106 on reader service card.
<table>
<thead>
<tr>
<th>Company Name</th>
<th>Address</th>
<th>Phone Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Richway Industries Ltd.</td>
<td>525 Main St. Janesville, IA 50647</td>
<td>319-987-2224</td>
</tr>
<tr>
<td>Riulex</td>
<td>301 E. Stevens Santa Ana, CA 92707</td>
<td></td>
</tr>
<tr>
<td>Robark Inc.</td>
<td>7309 Lake Dr. Lino Lakes, MN 55014</td>
<td>612-784-0657</td>
</tr>
<tr>
<td>Robinson Ind., Limb Lopper</td>
<td>11845 Burke St. Santa Fe Springs, CA 90670</td>
<td>213-945-1077</td>
</tr>
<tr>
<td>E.E. Rockey and Co.</td>
<td>378 Chelsea St. Paramus, NJ 07652</td>
<td>201-262-1077</td>
</tr>
<tr>
<td>Rodale Resources</td>
<td>576 North St. Emmaus, PA 18049</td>
<td>215-965-6010</td>
</tr>
<tr>
<td>Rokor Inc.</td>
<td>P.O. Box 1409, 310 Herring Ave. Wilson, NC 27893</td>
<td></td>
</tr>
<tr>
<td>Rolatape Corp.</td>
<td>4221 Redwood Ave. Los Angeles, CA 90066</td>
<td>213-822-2057</td>
</tr>
<tr>
<td>Roof Mfg. Co.</td>
<td>1011 W. Howard St. Pontiac, IL 61764</td>
<td>616-997-9212</td>
</tr>
<tr>
<td>Root Lowell</td>
<td>1000 Foreman Rd. Lowell, MI 49331</td>
<td>616-997-9212</td>
</tr>
<tr>
<td>Roseman Mower Co.</td>
<td>2300 Chestnut Ave. Glensview, IL 60025</td>
<td>312-729-2300</td>
</tr>
<tr>
<td>Rosenwach Inc.</td>
<td>40-25 Crescent St. Long Island City, NY 11011</td>
<td>212-729-4900</td>
</tr>
<tr>
<td>Royal Coach Sprinklers</td>
<td>4381 N. Brawley Ave. Fresno, CA 93711</td>
<td>209-442-0330</td>
</tr>
<tr>
<td>Royer Foundry &amp; Machine Co.</td>
<td>158 Pringle St. Kingston, PA 18704</td>
<td>717-287-9625</td>
</tr>
<tr>
<td>Rugg Mfg. Co.</td>
<td>105 Newton St. Greenfield, MA 01301</td>
<td>413-773-5471</td>
</tr>
<tr>
<td>Ryan Turf Equipment/OMC Lincoln</td>
<td>P.O. Box 82409 Lincoln, NE 68501</td>
<td></td>
</tr>
<tr>
<td>Ryther-Purdy</td>
<td>305 Elm St. Old Saybrook, CT 06475</td>
<td>203-388-4405</td>
</tr>
<tr>
<td>Sabre Saw Chain</td>
<td>10 Lafayette Sq. Buffalo, NY 14203</td>
<td></td>
</tr>
<tr>
<td>Safe-T-Lawn</td>
<td>5350 N.W. 165 St. Hialeah, FL 33014</td>
<td>305-625-7000</td>
</tr>
<tr>
<td>Safety Test Inc.</td>
<td>Drawer 400 Shelby, NC 28150</td>
<td>414-258-2700</td>
</tr>
<tr>
<td>Samson Ocean Systems</td>
<td>99 High St. Boston, MA 02110</td>
<td>617-426-6550</td>
</tr>
<tr>
<td>Sarlo Power Mowers</td>
<td>P.O. Box 1169 Ft. Myers, FL 33902</td>
<td></td>
</tr>
<tr>
<td>Satoh Agric. Mach. Mfg. Co.</td>
<td>P.O. Box 5020 New York, NY 10022</td>
<td>212-935-8826</td>
</tr>
<tr>
<td>Schutt's Equip. Co.</td>
<td>P.O. Box 412 Birmingham, MI 48012</td>
<td>313-642-6595</td>
</tr>
<tr>
<td>Schwartz Mfg.</td>
<td>129 Pine St. South Lester Prairie, MN 55354</td>
<td>612-395-2541</td>
</tr>
<tr>
<td>Seaman Co.</td>
<td>Box 25331 Milwaukee, WI 53201</td>
<td>414-781-8900</td>
</tr>
<tr>
<td>Selma Trailer &amp; Mfg. Co.</td>
<td>P.O. Box 120 Selma, CA 93662</td>
<td>513-644-0011</td>
</tr>
<tr>
<td>Selma Mfg. Co.</td>
<td>500 N. Broadway Seymour, IN 47274</td>
<td></td>
</tr>
<tr>
<td>Seymour Smith &amp; Son Inc.</td>
<td>900 Main St. Oakville, CT 06779</td>
<td>203-274-2558</td>
</tr>
<tr>
<td>SGL Battery</td>
<td>14650 Dequindre Detroit, MI 48212</td>
<td></td>
</tr>
<tr>
<td>Shenango Steel Bldg.</td>
<td>P.O. Box 268 W. Middlesex, PA 16159</td>
<td>412-528-9925</td>
</tr>
<tr>
<td>Side-Winder</td>
<td>P.O. Box 818 Minden, LA 71055</td>
<td></td>
</tr>
<tr>
<td>Signet Scientific</td>
<td>3401 Aerojet Ave. El Monte, CA 91734</td>
<td></td>
</tr>
<tr>
<td>Simplicity Mfg. Co.</td>
<td>366 Spring St. Port Washington, WI 53074</td>
<td></td>
</tr>
<tr>
<td>Sioux Steam Cleaner</td>
<td>Highway 46 &amp; I-29 Beresford, SD 57004</td>
<td>605-763-2776</td>
</tr>
<tr>
<td>Skibbe Mfg. Co.</td>
<td>3783 S. Pipestone Rd. Sodus, MI 49126</td>
<td></td>
</tr>
<tr>
<td>Skil Corp.</td>
<td>4801 W. Peterson Ave. Chicago, IL 60646</td>
<td>312-886-7390</td>
</tr>
<tr>
<td>Skinner Irrigation Co.</td>
<td>P.O. Box 14249 Cincinnati, OH 45214</td>
<td></td>
</tr>
<tr>
<td>Smith Precision Prod.</td>
<td>1299 Lawrence Dr. Newbury Park, CA 91320</td>
<td>805-498-6616</td>
</tr>
<tr>
<td>Smithco</td>
<td>11 W. Ave. Wayne, PA 19087</td>
<td></td>
</tr>
<tr>
<td>Snowco</td>
<td>4350 McKinley St. Omaha, NE 68112</td>
<td>402-453-2200</td>
</tr>
<tr>
<td>Soil Moisture Equip. Corp.</td>
<td>801 S. Kellogg Ave. Goleta, CA 93017</td>
<td></td>
</tr>
<tr>
<td>Soilcell Land and Building, Inc.</td>
<td>412 113th Street Arlington, TX 76011</td>
<td>817-640-1488</td>
</tr>
<tr>
<td>Solo Inc.</td>
<td>Box 5030 Newport News, VA 23605</td>
<td>804-245-4228</td>
</tr>
<tr>
<td>Sorensen Sprayers Inc.</td>
<td>Box 344 Worthington, MN 56187</td>
<td></td>
</tr>
<tr>
<td>Spartan Tree Equip. Co.</td>
<td>16084 S. Chandler Rd. East Lansing, MI 48823</td>
<td>517-351-1370</td>
</tr>
<tr>
<td>Company</td>
<td>Address</td>
<td>Phone</td>
</tr>
<tr>
<td>---------------------------------</td>
<td>--------------------------------------</td>
<td>---------------------</td>
</tr>
<tr>
<td>Speedex Tractor Co.</td>
<td>367 N. Freedom St. Ravenna, OH 44266</td>
<td>216-297-1484</td>
</tr>
<tr>
<td>Sperry New Holland</td>
<td>New Holland, PA 17557</td>
<td></td>
</tr>
<tr>
<td>Spray Baby Inc.</td>
<td>23281 Vista Grande #A Laguna Hills, CA 92653</td>
<td>215-948-4000</td>
</tr>
<tr>
<td>Spraying Systems Co.</td>
<td>North Ave. Wheaton, IL 60187</td>
<td>312-665-5000</td>
</tr>
<tr>
<td>Spyder Sales Inc.</td>
<td>12838 Westheimer Rd. Houston, TX 77077</td>
<td>713-496-4730</td>
</tr>
<tr>
<td>Standard Golf Co.</td>
<td>220 E. 4th St. Cedar Falls, IA 50613</td>
<td>319-266-2638</td>
</tr>
<tr>
<td>Stanley Hydraulic Tools</td>
<td>3810 S.E. Nael Rd. Milwaukee, WI 53222</td>
<td>503-659-5660</td>
</tr>
<tr>
<td>Starrco Co. Inc.</td>
<td>1515 Fairview Ave. St. Louis, MO 63132</td>
<td></td>
</tr>
<tr>
<td>States Engr. Corp.</td>
<td>12657 Church Rd. Orrville, OH 44667</td>
<td>216-683-4313</td>
</tr>
<tr>
<td>Still Inc.</td>
<td>536 Viking Dr. Virginia Beach, VA 23452</td>
<td></td>
</tr>
<tr>
<td>Sto-Cote Prod.</td>
<td>800-435-2627</td>
<td></td>
</tr>
<tr>
<td>Strong Mfg. Co.</td>
<td>P.O. Box 8068 Pine Bluff, AR 71611</td>
<td>501-355-4753</td>
</tr>
<tr>
<td>Storr Tractor Co.</td>
<td>36 Birch Dr. Newton, NJ 07860</td>
<td></td>
</tr>
<tr>
<td>Street Lighting Equip. Corp.</td>
<td>31-23 61 St. Woodside, NY 11377</td>
<td>212-726-1052</td>
</tr>
<tr>
<td>Strong Ent. Inc.</td>
<td>7270 SW 42nd St. Miami, FL 33155</td>
<td></td>
</tr>
<tr>
<td>Sturdi-Built Mfg. Co.</td>
<td>11304 S.W. Boones Ferry Rd. Portland, OR 97219</td>
<td></td>
</tr>
<tr>
<td>SturdiSteel</td>
<td>P.O. Drawer 949 Waco, TX 76703</td>
<td>817-756-2121</td>
</tr>
<tr>
<td>Submatic Irrigation Systems</td>
<td>P.O. Box 246 Lubbock, TX 79408</td>
<td>806-947-9000</td>
</tr>
<tr>
<td>Sudbury Laboratory Inc.</td>
<td>572 Dutton Rd. Sudbury, MA 01776</td>
<td></td>
</tr>
<tr>
<td>Sunglo Greenhouses</td>
<td>3714 South Hudson St. Seattle, WA 98118</td>
<td></td>
</tr>
<tr>
<td>Sun Trak Industries</td>
<td>Harvard, IL</td>
<td></td>
</tr>
<tr>
<td>Suzuki</td>
<td>5500 Plaza Del Norte Carlsbad, CA 92008</td>
<td></td>
</tr>
<tr>
<td>Sweeper Inc., Jenkins Equip. Co.</td>
<td>2810 Baker Rd. Dexter, MI 48130</td>
<td>313-426-3961</td>
</tr>
<tr>
<td>Swenson Spreader Co.</td>
<td>Sub of Dickey John Corp. P.O. Box 127 Lindenhurst, IL 61049</td>
<td></td>
</tr>
<tr>
<td>Tanaka Kogyo (USA)</td>
<td>7509 South 228th Kent, WA 98031</td>
<td>206-854-7706</td>
</tr>
<tr>
<td>Taylor Dunn Mfg. Co.</td>
<td>Box 4240 Anaheim, CA 92804</td>
<td></td>
</tr>
<tr>
<td>Tecumseh Prod. Co.</td>
<td>900 North St. Grafton, WI 53024</td>
<td>414-377-2700</td>
</tr>
<tr>
<td>Teledyne-Wisconsin Motor</td>
<td>1910 S. 53rd St. Milwaukee, WI 53219</td>
<td></td>
</tr>
<tr>
<td>Telso Ind.</td>
<td>P.O. Box 18205 Dallas, TX 75218</td>
<td></td>
</tr>
<tr>
<td>Tennant Co.</td>
<td>701 N. Lilac Dr. Minneapolis, MN 55422</td>
<td></td>
</tr>
<tr>
<td>Tensen Company, Inc.</td>
<td>304 S.E. Second Ave. Portland, OR 97214</td>
<td>503-239-5222</td>
</tr>
<tr>
<td>Terrain King Corp.</td>
<td>P.O. Drawer 549 Sequin, TX 78155</td>
<td></td>
</tr>
<tr>
<td>Texas Greenhouse Co.</td>
<td>Box 11219 Ft. Worth, TX 76110</td>
<td></td>
</tr>
<tr>
<td>Thatch-Away Mfg. Co.</td>
<td>90 Beechwood Rd. Louisville, KY 40207</td>
<td></td>
</tr>
<tr>
<td>Thompson Mfg. Co.</td>
<td>2251 E. 7th St. Los Angeles, CA 90023</td>
<td>213-269-8233</td>
</tr>
<tr>
<td>Tiger Corp.</td>
<td>Box 1012 Sioux Falls, SD 57101</td>
<td>605-336-7900</td>
</tr>
<tr>
<td>Timberlodge Inc.</td>
<td>105 W. 18th Ave. N. Kansas City, MO 64116</td>
<td></td>
</tr>
<tr>
<td>Torco Equip. Co.</td>
<td>207 Elker St. Louisville, KY 40214</td>
<td></td>
</tr>
<tr>
<td>Toro Co.</td>
<td>8111 Lyndale Ave. S. Minneapolis, MN 55420</td>
<td></td>
</tr>
<tr>
<td>Toro Irrigation Div.</td>
<td>P.O. Box 489 Riverside, CA 92502</td>
<td>714-359-0701</td>
</tr>
<tr>
<td>Towt Industries Intl'</td>
<td>Box 245 Kingsburg, CA 93631</td>
<td>209-897-5121</td>
</tr>
<tr>
<td>Trac 'N Combo</td>
<td>P.O. Box 7 Metuchen, NJ 08840</td>
<td></td>
</tr>
<tr>
<td>Tradewinds, Inc.</td>
<td>Box 1191 Tacoma, WA 98401</td>
<td></td>
</tr>
<tr>
<td>Trail/Dump Co.</td>
<td>2448 Landerdale Dr. Atlanta, GA 30345</td>
<td></td>
</tr>
<tr>
<td>Travelrain</td>
<td>239 N. Robertson Blvd. Beverly Hills, CA</td>
<td>213-276-8848</td>
</tr>
<tr>
<td>Trojan Battery Co.</td>
<td>9440 Ann St. Santa Fe Springs, CA 90670</td>
<td></td>
</tr>
<tr>
<td>Trojan Playground Equip.</td>
<td>St. Cloud, MN 56301</td>
<td></td>
</tr>
<tr>
<td>Trooper Co.</td>
<td>P.O. Box 96 Issaquah, WA 98027</td>
<td></td>
</tr>
<tr>
<td>True Friends Garden Tools, Inc.</td>
<td>100 State St. Teaneck, NJ 07666</td>
<td></td>
</tr>
<tr>
<td>Trusco Mfg. Co.</td>
<td>398 N.E. 38th St. Ft. Lauderdale, FL 33334</td>
<td>305-665-6541</td>
</tr>
<tr>
<td>Tubular Prod. Inc.</td>
<td>Souderton, PA 18964</td>
<td></td>
</tr>
<tr>
<td>Tuflex Mfg. Co.</td>
<td>P.O. Box 13143 Ft. Lauderdale, FL 33316</td>
<td>305-525-8815</td>
</tr>
</tbody>
</table>
Equipment Companies

continued

Turf Service Lab
11762 Western Ave.
Stanton, CA 90680

Turf-Vac
P.O. Box 4339
Long Beach, CA 90804

Turfo Prod. Co.
3456 Washington Ave.
Minneapolis, MN 55412

Turfgrass Prod. Corp.
1934 N.E. 151 St.
N. Miami, FL 33162

Turfibre Prod.
1934 N.E. 151 St.
N. Miami, FL 33162
305-947-4649

Turfco Prod. Co.
3456 Washington Ave.
Minneapolis, MN 55412

Turfgrass Prod. Corp.
1934 N.E. 151 St.
N. Miami, FL 33162

Turf-Vac
P.O. Box 4339
Long Beach, CA 90804

Vee Ent.
Box 1047
Des Moines, IA 50311
515-276-5377

Vegetable Factory
Box 2235, Grand Central Station
New York, NY 10017

Vemco Corp.
1331 23rd St.
Racine, WI 53403
414-634-6050

Ventura Mfg. & Implement Co.
1265 Commercial Ave.
P.O. Box 1069
Oxnard, CA 93030
805-486-8444

Verandel Co.
Box 1568
Worcester, MA 01601

Vermeer Mfg. Co.
Box 200
Pella, IA 50219
515-628-3141

Vierra Mfg. Co.
Box 632
Billings, MT 59103
406-252-6806

Vicon Farm Mach.
3741 Cook Blvd.
Chesapeake, VA 23323
804-485-1600

Vilero Stanley Inc.
P.O. Box 93
Dunkirk, MD 20754

W-G Grinder Inc.
Box 4029
Wichita, KS 67204
316-836-4229

Walbro Corp.
Cass City, MI 48726
517-872-2131

Walker/Parkersburg, Div. of Textron
P.O. Box 1828
Parkersburg, WV 26101

Jim Walls Company
Commerce Plaza, Suite 126
12820 Hillcrest Rd.
Dallas, TX 75230

Walsh Mfg. Co.
1200 Fisher St.
Charles City, IA 50616
515-228-3414

Wanner Engineering, Inc.
1204 Chestnut Ave.
Minneapolis, MN
612-336-5681

The Warren Rupp Co.
P.O. Box 1568-E
Mansfield, OH 44901
419-524-8388

Wheel Horse Prod.
515 W. Ireland Rd.
South Bend, IN 46614
219-291-3112

Wheel Spray Co.
P.O. Box 97
Delcofied, WI 53018
414-646-8640

Wide Lite
P.O. Box 606
San Marcos, TX 78666
512-392-5821

Vandermolen Corp.
119 Dorsa Ave.
Livingston, NJ 07039
201-692-8506

Van Pines Inc.
Box 768
West Olive, MI 49460
616-399-1620

Vee Ent.
Box 1047
Des Moines, IA 50311
515-276-5377

Vegetable Factory
Box 2235, Grand Central Station
New York, NY 10017

Washington Industrial Resources
12514 Pacific Highway S.
Seattle, WA 98168
206-244-9510

Water Works Garden Houses
Box 905
El Cerrito, CA 94530

Weather-Tech, Corp.
5645 E. Clinton Ave.
Fresno, CA 93727
209-291-5555

Weathermatic, Div. of Telco Ind.
P.O. Box 18205
Dallas, TX 75218
214-276-6131

Webber Systems Inc.
P.O. Drawer L
New Hope, AL 35760

Weed Eater Inc., Div. Emerson Electric
5146 Richmond Ave.
Houston, TX 77036

Wells Cargo
1532 McNaughton St.
Elkhart, IN 46515

Welsbach Lighting Inc.
240 Sargent Dr.
New Haven, CT 06511
203-789-1710

Western Cascade Inc.
1150 N. Red Gum St.
Anaheim, CA 92803
714-630-4640

Western Products Div.
7777 N. 73rd St.
Milwaukee, WI 53223
414-354-2310

Western Wood Structures
8333 S.W. Cirrus Dr.
Beaverton, OR 97005
503-644-1721

Westheffer Co. Inc.
Box 363
Lawrence, KS 66044
913-843-1633

Westinghouse Electric Corp.
Lamp Div.
Bloomfield, NJ 07003

Wheel Horse Prod.
515 W. Ireland Rd.
South Bend, IN 46614
219-291-3112

Wheel Spray Co.
P.O. Box 97
Delcofied, WI 53018
414-646-8640

White Farm Equip.
2625 Butterfield Rd.
Oak Brook, IL 60521
312-887-0110

Wide Lite
P.O. Box 606
San Marcos, TX 78666
512-392-5821
We put a lot into our Turf-Truckster.

One of the most dependable vehicles for moving your crew around is the 3- or 4-wheel Cushman® Turf-Truckster. But it was also designed for more than just transportation.

Equipped with an optional PTO and hydraulic system, both models accept a wide range of special, add-on turf maintenance equipment. So with just one Turf-Truckster you can haul, dump, grade, seed, spray, spread, top dress, aerate and more.

But there's more to a Turf-Truckster than versatility. There's a rugged 18-hp engine that's built to take on your turf. It comes with a standard 2 to 1 auxiliary transmission. A transmission built to allow a gear driven PTO to be attached directly to it. And common sense engineering makes the Turf-Truckster steer clear of the repair shop, too.

The 3-wheel model gives you the maneuverability of a tight 17' turning circle, while the 4-wheeler has seating room for two. And it just takes minutes to add any of the Turf-Truckster's accessory pieces, thanks to Cushman's pin disconnect system. No bolting, no hitching. Just snap two or three pull pins in place and you're ready to hit the turf.

If a good transportation/hauling vehicle is all you need, though, look at the Cushman Runabouts. There's an 18-hp two-seater, and a fuel-stingy 12-hp one-seater model. Both Runabouts are economical to own. And like any Cushman vehicle, they're built tough.

There's nothing like a Turf-Truckster or Runabout to get more work done, in less time and with less manpower. For a closer look at what goes into, or behind, a Cushman vehicle, return this coupon today.

Show me what you put into a vehicle, Cushman.

- I'd like a demonstration of the Turf-Truckster (3-wheel or 4-wheel). (Circle One)
- I'd like a demonstration of the Runabout (12-hp or 18-hp). (Circle One)
- I'm interested in seeing these Turf-Truckster attachments: □ Aerator; □ Sprayer; □ Top Dresser; □ Grader/Scarifier; □ Flatbed/Dump Box; □ Cyclone Seeder/Spreader.
- Send me your new 1980 catalog.

Name
Title
Address
City State Zip

And a lot behind it.

CUSHMAN
The Labor-Saving Turf System.
5028 Cushman, P.O. Box 82409
Lincoln, NE 68501, 402-435-7208
A Unit of Martin Corporation
1979 All rights reserved.

Write 104 on reader service card
3. Chemicals

Adjuvant/Carrier

Clear Chemical Corp.

Drexel Chemical Co.

Kalo Labs Inc.

Leifingwell Chemical Co.

Gilco Chemicals Co.

PBI Gordon Corp.

Rhone-Poulenc

Rohm & Hass

Thompson-Hayward Chem.

Algaecide

Applied Biochemists Inc.

Ciba Geigy Corp.

Cloro-Spray Corp.

Great Lakes Biochemical

Thompson-Hayward Chem.

Woodbury Chemical Co.

Antitranspirant

C.B. Dolge

Cloro-Spray Corp.

Miller Chemical & Fertilizer

Wilt Pruf Products Inc.

PBI Gordon Corp.

Aquatic Herbicides

Amchem Products Inc.

Applied Biochemists Inc.

Chevron Chemical Co.

Ciba Geigy

Dow Chemical Corp.

Great Lakes Biochemical

Co. Inc.

Pennwalt

Thompson-Hayward Chem.

3M Co.

Colorant

Cleary Chemical Corp.

International Research

Union

Mallinckrodt Inc.

Compatability Agent

Amoco Oil Co.

Arjay, Inc.

Hopkins Agric. Chemical

Kalo Labs Inc.

Loveland Ind. Inc.

Miller Chemical & Fertilizer

Occidental Chem. Co.

Organic Labs Inc.

Rigo Co.

Sandoz Inc.

Stull Chemical Co.

Thompson-Hayward Chem.

Defoamer

Loveland Ind. Inc.

Miller Chemical & Fertilizer

Naico Chemical Co.

Dethatcher

Agro-Chem

Bis Dethatch

Drift Retardant

Loveland Ind. Inc.

Naico Chemical Co.

Fertilizer, Tree

Creative Sales, Inc.

Fertilizer, Turf

Agro-Chem. Inc.

Competition

Rigolotrol

Boots Hercules Agrochemicals Co. is marketing Nitroform, a high-analysis, organic, ureaform nitrogen (38-0-0) that soil microorganisms utilize. Field tests have shown that when Nitroform is used as the source of nitrogen in a seed bed or fertilization program, a residual is established in the soil for sustained nourishment.
THE PROTECTORS

for thousands of growers, nurserymen and landscapers...

WILT-PRUF
...the proven anti-transpirant for over thirty years, keeps trees, shrubs, sod and indoor plants healthy. Protects against plant damage due to winter kill, transplant shock, wind burn, drought and air pollution. Concentrate is available in Pints, Quarts, Gallons, 5-Gallon, 30-Gallon and 55-Gallon sizes. Also available in 16 Oz. Redi-Spray.

SPRAY STAY
...sticker-extender — the perfect marriage between your spray and ours! Sticks sprays to trees, plants, crops and turf protecting against costly run-off due to rain or irrigation; prolongs adhesion and effectiveness of fungicides, herbicides, insecticides and pesticides. Comes in Pint, Gallon and 5-Gallon containers.

Note: SPRAY STAY and all WILT-PRUF products meet specifications of the Food and Drug Administration for use on edible crops. 100% organic and biodegradable; does not require registration with the EPA. Is non-toxic to eyes and skin. and is not damaged by freezing.

For more information call or write Dept. WTT

Wilt-Pruf Products
P.O. BOX 4280 GREENWICH, CONNECTICUT 06830

for thousands of consumers and indoor plant lovers...

WILT-PRUF I
...for Christmas trees, wreaths and greens, to retard needle drop and reduce fire hazard; keeps them fresh for the entire holiday season! WILT-PRUF I produces a thin, transparent film substantially reducing excessive evaporation when evergreens are brought indoors. Comes in 10 oz. Redi-Spray.

WILT-PRUF II
...for indoor plant protection, helps plants from drying out and wilting. When sprayed on plant foliage, WILT-PRUF II provides a thin, transparent film which acts as a protective coating substantially reducing water loss during periods when excessive evaporation occurs. WILT-PRUF II helps the appearance of foliage by providing a slight gloss to the surface of the leaves. (Avoid using on plants with hairy leaves such as African Violets.) Comes in 10 oz. Redi-Spray.

Parinol
Parnon
Peperalin
Pipron
Captan 30-DD
Thiabendazole
Correx
Benomyl
Cadmium + Thiram
Dacthal
Banrot
Duosen
Cadmium
Sebacate + Thiram
Cadmium Succinate
Casmitate
Cilo-Clor
Calo-Gran
Ethazole
Ethazole + Thiaphanate
Methyl
Fungo 50
Kroban 30
Kromad
Mercuric + Mercurous Chloride
Thiophanate
Thiram
Thiramad
Truban
Baygon
Dyrene
Penaminosulf
Lesan

Wilt-Pruf Products P.O. BOX 4280 GREENWICH, CONNECTICUT 06830

Write 146 on reader service card
Why this magazine and more than 750 others let us go over their books once a year.

Some magazines, we're sorry to say, keep their readers undercover. They steadfastly refuse to let BPA (Business Publications Audit of Circulation, Inc.) or any other independent, not-for-profit organization audit their circulation records.

We think the reason is obvious: These magazines are less than proud of the quantity and quality of their readers.

On the other hand, over 750 publications (like this one) belong to BPA. Once a year, BPA auditors examine and verify the accuracy of our circulation records.

This audit provides the name, company, industry and job title of every reader each publication reaches. The information helps advertisers to determine if they are saying the right thing to the right people in the right place.

It also helps somebody else important: you. Because the more a publication and its advertisers know about you, the better they can provide you with articles and advertisements that meet your informational needs.


We make sure you get what you pay for.
<table>
<thead>
<tr>
<th>Company Name</th>
<th>Chemicals/Products</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ortho Div., Chevron Chemical Co. PBI Gordon Corp.</td>
<td></td>
</tr>
<tr>
<td>Pennwalt Corp. Rhone-Poulenc</td>
<td></td>
</tr>
<tr>
<td>Rohm &amp; Haas</td>
<td></td>
</tr>
<tr>
<td>Stauffer Chemical Co.</td>
<td></td>
</tr>
<tr>
<td>The Andersons TUCO, Div. of Upjohn Co.</td>
<td></td>
</tr>
<tr>
<td>TUCO, Div. of Upjohn Co. TUCO, Div. of Upjohn Co.</td>
<td></td>
</tr>
<tr>
<td>Vineland Chemical Co.</td>
<td></td>
</tr>
<tr>
<td>Elanco Prod. Co., Eli Lilly Maag Agrochemicals Mallinckrodt Inc.</td>
<td></td>
</tr>
<tr>
<td>Herbicides</td>
<td>Amchem Products Inc. American Cyanamid Aquashade Inc. BASF Wyandotte Corp. Best Products</td>
</tr>
<tr>
<td>Bonide Chemical Co., Inc. C.B. Dolge</td>
<td></td>
</tr>
<tr>
<td>Ciba Geigy Corp.</td>
<td></td>
</tr>
<tr>
<td>Cleary Chemical Corp. Simazine Supracide Trimec AMA AMAM + 2,4-D MCP A MCP + 2,4-D Methan 30 Broadsid Phtyra Weed Zapper Dacthal Dacamine Daconate Dinltri Amine Dalapon Dowpon Esteron 99 Formula 40 Karon Premerge 3 2,4-D Ansar 529 MMA + Surfactant Ammato Bromacil Hyvar X-L Krenite Krover Lexone DF Siduron Velpar Balan Benefin Oryzalin Spike Surlan</td>
<td></td>
</tr>
</tbody>
</table>
Estech General Chemicals Corp. has developed a new concept in slow-released turf fertilizers called IB-DU/SCU. The mix blends a three nitrogen formula with sulfur-coated urea and water soluble urea to provide a three-stage release that lasts up to 90 days.

Creative Sales, Inc. has produced an in-store display that tells the story of the MEDICAP systemic implant. The display contains the convenient “Ten-Paks” that are adequate to treat an average tree, plus ACECAP, a systemic insecticide implant.

Monsanto Agricultural Products Co. has developed Roundup, an herbicide for controlling a wide range of perennial and annual weeds and grasses in one application. It can be mixed with water and applied with boom equipment, hand-held and high volume equipment (including knapsack sprayers), and shielded sprayers.
### Mulches, Erosion Control
- American Excelsior Co.
- Cellin Mfg. Inc.
- Conwed Corp.
- Fibraxmulch
- Fibre Therm
- Fibrex Corp.
- Grass Fiber Inc.
- Grass Growers
- Gulf States Paper Corp.
- IMC Chemical Group, Inc.
- International United Chem.
- National Bark Sales
- Owens Corning
- Spartan Tree Equip. Co.
- Strong Mfg. Co.
- Superior Fiber Prod. Co.
- Weyerhaeuser

### Mulches, Erosion Control
- Silvatiber

### Rodenticides
- Bell Laboratories
- Chempar Chemical Co.

### Root Killer
- Bacillus Thuringiensis
- Bactur
- De-Fend
- Dimilin
- Baam
- Proxol
- Trichlorfon
- Carbaryl
- Sevin
- Chlordane
- Mosquito

### Root Killer
- American Pelletizing Corp.

### Soil Conditioner
- C.B. Dolge
- Environmental Stabilizers Int.
- Hyper-Humus Co.
- ICI

### Soil Conditioner
- IMC Chemical Group, Inc.
- Michigan Peat Co.
- Nalco Chemical Co.
- Oil Dri Corp of America
- PBI Gordon Corp.
- Petrochemicals Co.
- Soil Prods. Development
- U.S. Gypsum Co.
- W.R. Grace & Co.

### Soil Fumigants
- Great Lakes Chemicals
- Brom-O-Gas
- Meth-O-Gas
- Terr-O-Gas
- Methyl Bromide
- Micro-Fume

### Sticker/Extender
- Hopkins Agric. Chemicals
- Loveland Ind. Inc.
- Miller Chemical & Fertilizer
- Wilt Pruf Prod. Inc.
- PBI Gordon Corp.

### Wetting Agents
- Aquatrols Corp.
- Cloro-Spray Corp.
- Hopkins Agric. Chemicals
- Kalo Laboratories Inc.
- Loveland Ind. Inc.
- Montco Prod. Corp.
- PBI Gordon Corp.

### Say hello to **Sod-Saver** landscaping blocks...

**and good-bye to turf damage!**

- Made of heavy-duty molded plastic, resistant to water, acid, heat, and extreme cold.
- Easy to install and can be cut to fit with an ordinary saw.
- Load-bearing ... provides a secure foundation for service and emergency vehicles.

Distributor inquiries invited.

### Distributor:
- 36" x 12" blocks.
- 1½" thick for normal use.
- 2¼" thick for heavy duty use.

Cutaway to show root growth.

**PRESTO PRODUCTS, INCORPORATED**
**INSTITUTIONAL DIVISION**
P.O. Box 2399 • Appleton, Wisconsin 54913
(414)739-9471

Write 114 on reader service card

SEPTEMBER 1980/WEEDS TREES & TURF  79
### 4. Chemical Companies

<table>
<thead>
<tr>
<th>Company</th>
<th>Address</th>
<th>Phone</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abbott Laboratories</td>
<td>Dept. 95M North Chicago, IL 60064</td>
<td>312-455-6900</td>
</tr>
<tr>
<td>Agro-Chem</td>
<td>11150 W. Addison Franklin Park, IL 60131</td>
<td>713-665-1130</td>
</tr>
<tr>
<td>Agway Inc.</td>
<td>Box 1333 Syracuse, NY 13201</td>
<td>312-455-6900</td>
</tr>
<tr>
<td>Allied Chemical</td>
<td>Box 2120 Houston, TX 77001</td>
<td>713-960-7924</td>
</tr>
<tr>
<td>Amchem Products, Inc.</td>
<td>300 Brookside Ave. Ambler, PA 19002</td>
<td>215-628-1374</td>
</tr>
<tr>
<td>American Cyanamid</td>
<td>P.O. Box 400 Princeton, NJ 08540</td>
<td>609-799-0400</td>
</tr>
<tr>
<td>American Excelsior Co.</td>
<td>3699 Kinsman Blvd. Madison, WI 53704</td>
<td>608-241-0200</td>
</tr>
<tr>
<td>American Pelletizing Corp.</td>
<td>P.O. Box 3628 Des Moines, IA 50322</td>
<td>515-278-5900</td>
</tr>
<tr>
<td>Amoco Oil Co.</td>
<td>200 E. Randolph Dr. Chicago, IL 60601</td>
<td>312-856-5760</td>
</tr>
<tr>
<td>The Andersons</td>
<td>P.O. Box 119 Maumee, OH 43537</td>
<td>419-893-90-90</td>
</tr>
<tr>
<td>The Anslu Co.</td>
<td>One Stanton St. Marinette, WI 54143</td>
<td>215-628-1374</td>
</tr>
<tr>
<td>Applied Biochemists Inc.</td>
<td>5300 W. County Line Rd. Mequon, WI 53092</td>
<td>609-665-1130</td>
</tr>
<tr>
<td>Aquashade Inc.</td>
<td>Box 198 Eldred, NY 12732</td>
<td>914-557-8077</td>
</tr>
<tr>
<td>Aquatrols Corp.</td>
<td>1432 Union Ave. Pennsauken, NJ 08110</td>
<td>713-433-8651</td>
</tr>
<tr>
<td>Arjay, Inc.</td>
<td>13,318 Almeda Rd. Houston, TX 77045</td>
<td>209-858-2541</td>
</tr>
<tr>
<td>Ashland Chemical Co.</td>
<td>P.O. Box 2219 Columbus, OH 43216</td>
<td>312-455-6900</td>
</tr>
<tr>
<td>BASF Wyandotte Corp.</td>
<td>100 Cherry Hill Rd. Parsippany, NJ 07054</td>
<td>713-665-1130</td>
</tr>
<tr>
<td>Bell Laboratories, Inc.</td>
<td>3699 Kinsman Blvd. Madison, WI 53704</td>
<td>608-241-0200</td>
</tr>
<tr>
<td>Best Products</td>
<td>P.O. Box 267 Lathrop, CA 95330</td>
<td>617-449-3970</td>
</tr>
<tr>
<td>Bio Dethatch Inc.</td>
<td>845 River Crest Ct. Louisville, KY 40206</td>
<td>617-449-3970</td>
</tr>
<tr>
<td>Bonide Chemical Co., Inc.</td>
<td>2 Wurz Ave. Yorkville, NY 13495</td>
<td>312-268-6216</td>
</tr>
<tr>
<td>Boots Hercules, Inc.</td>
<td>910 North Market Street Wilmington DE 19899</td>
<td>312-622-1221</td>
</tr>
<tr>
<td>C.B. Dolge</td>
<td>11 Ferry Ln. Westport, CT 06880</td>
<td>203-227-9591</td>
</tr>
<tr>
<td>Cal Fiber Co.</td>
<td>611 S. Anderson St. Los Angeles, CA 90023</td>
<td>213-268-0191</td>
</tr>
<tr>
<td>Canadian Ind. Ltd.</td>
<td>P.O. Box 5201 London, Ont., CN N6A 4L6</td>
<td>519-672-9220</td>
</tr>
<tr>
<td>Cellin Mfg. Inc.</td>
<td>P.O. Box 686 Springfield, VA 22150</td>
<td>713-662-1221</td>
</tr>
<tr>
<td>Chempar Chemical Co., Inc.</td>
<td>60 East 42nd St. New York, NY 10017</td>
<td>212-687-3990</td>
</tr>
<tr>
<td>Chevron Chem Co.</td>
<td>575 Market St. San Francisco, CA 94105</td>
<td>517-636-0968</td>
</tr>
<tr>
<td>Ciba Geigy Corp.</td>
<td>P.O. Box 11422 Greensboro, NC 27409</td>
<td>919-292-7100</td>
</tr>
<tr>
<td>Cities Service Co.</td>
<td>P.O. Box 50360 Atlanta, GA 30302</td>
<td>312-455-6900</td>
</tr>
<tr>
<td>Clarion Development Co.</td>
<td>126 Arla Dr. Pittsburgh, PA 15220</td>
<td>713-665-1130</td>
</tr>
<tr>
<td>Clearay Chemical Corp.</td>
<td>P.O. Box 10 Somerset, NJ 08873</td>
<td>201-247-6000</td>
</tr>
<tr>
<td>Cloro-Spray Corp.</td>
<td>475 Beaver St. Bristol, PA 19007</td>
<td>215-826-0375</td>
</tr>
<tr>
<td>Conrel</td>
<td>110 A Street Needham Heights, MA 02194</td>
<td>617-640-1555</td>
</tr>
<tr>
<td>Creative Sales, Inc.</td>
<td>222 N. Park Ave. Fremont, NE 68025</td>
<td>402-727-4800</td>
</tr>
<tr>
<td>Crown Chemical Co.</td>
<td>4325 Duncan Ave. St. Louis, MO 63010</td>
<td>713-662-1221</td>
</tr>
<tr>
<td>Crystal Chem. Co.</td>
<td>1525 N. Post Oak Rd. Houston, TX</td>
<td>919-292-7100</td>
</tr>
<tr>
<td>Cytozyme Laboratories Inc.</td>
<td>134 S. 700 W. Salt Lake City, UT 84104</td>
<td>801-533-9208</td>
</tr>
<tr>
<td>Davey Tree Exp. Inc.</td>
<td>City Bank Bldg. Kent, OH 44240</td>
<td>216-694-5000</td>
</tr>
<tr>
<td>Diamond Shamrock Corp.</td>
<td>1100 Superior Ave. Cleveland, OH 44114</td>
<td>216-969-0500</td>
</tr>
<tr>
<td>Dow Chemical U.S.A.</td>
<td>P.O. Box 1706 Midland, MI 48640</td>
<td>517-636-0968</td>
</tr>
<tr>
<td>Drexel Chem. Co.</td>
<td>P.O. Box 9306, 2487 Pennsylvania Ave. Memphis, TN 38109</td>
<td>901-774-4370</td>
</tr>
<tr>
<td>Chemical Companies</td>
<td>Michigan Peat Co.</td>
<td>Pennwell Corp.</td>
</tr>
<tr>
<td>-------------------</td>
<td>------------------</td>
<td>----------------</td>
</tr>
<tr>
<td>IMC Chemical Group, Inc.</td>
<td>Box 66388</td>
<td>1630 E. Shaw</td>
</tr>
<tr>
<td>2000 Prudential Tower</td>
<td>Houston, TX 77006</td>
<td>Fresno, CA 93710</td>
</tr>
<tr>
<td>Boston, MA 02199</td>
<td>Tom Brandon</td>
<td>209-226-8400</td>
</tr>
<tr>
<td>617-226-8100</td>
<td>Miller Chemical &amp; Fertilizer Corp.</td>
<td>Petrochemicals Co.</td>
</tr>
<tr>
<td>International Research Union</td>
<td>P.O. Box 333</td>
<td>P.O. Box 2199</td>
</tr>
<tr>
<td>3401 W. Fordham</td>
<td>Hanover, PA 17331</td>
<td>Ft. Worth, TX 76101</td>
</tr>
<tr>
<td>Santa Ana, CA 92704</td>
<td>Mobay Chemical Corp., Ag. Chem. Div.</td>
<td>817-625-2111</td>
</tr>
<tr>
<td>International Spike, Inc.</td>
<td>P.O. Box 4913</td>
<td>Phillips Petroleum Co.</td>
</tr>
<tr>
<td>P.O. Box 1750</td>
<td>Kansas City, MO 64120</td>
<td>Special Products Div.</td>
</tr>
<tr>
<td>Santa Ana, CA 92704</td>
<td>816-242-2000</td>
<td>Bartlesville, OK 74004</td>
</tr>
<tr>
<td>645 E. 60th St.</td>
<td>800 N. Lindbergh Blvd.</td>
<td>624 W. 119th St.</td>
</tr>
<tr>
<td>Los Angeles, CA 90001</td>
<td>St. Louis, MO 63166</td>
<td>Chicago, IL 60628</td>
</tr>
<tr>
<td>800-421-5904</td>
<td>Montco Prod. Corp.</td>
<td>312-264-0450</td>
</tr>
<tr>
<td>J.J. Maugen Co.</td>
<td>P.O. Box 404</td>
<td>PPG Ind. Inc., Chem. Div.</td>
</tr>
<tr>
<td>P.O. Box 3422</td>
<td>Ambler, PA 19002</td>
<td>One Gateway Ctr.</td>
</tr>
<tr>
<td>Burbank, CA 91504</td>
<td>Robert Oehsle</td>
<td>Pittsburgh, PA 15222</td>
</tr>
<tr>
<td>Kaiser Ag. Chem.</td>
<td>215-628-3144</td>
<td>Recmarre Co.</td>
</tr>
<tr>
<td>P.O. Box 46</td>
<td></td>
<td>20727 Seventh Ave. S.</td>
</tr>
<tr>
<td>Savannah, GA 31402</td>
<td></td>
<td>Seattle, WA 98148</td>
</tr>
<tr>
<td>Kalo Labs Inc.</td>
<td></td>
<td>206-824-2365</td>
</tr>
<tr>
<td>9233 Ward Pkwy.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kansas City, MO 64110</td>
<td></td>
<td></td>
</tr>
<tr>
<td>816-383-1800</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lakeshore</td>
<td></td>
<td></td>
</tr>
<tr>
<td>300 S. Abbe Rd.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Elyria, OH 44035</td>
<td></td>
<td></td>
</tr>
<tr>
<td>216-323-7544</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lebanon Chemical Corp.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>West Ross Lane, P.O. Box 647</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Danville, IL 61382</td>
<td></td>
<td></td>
</tr>
<tr>
<td>217-446-8983</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Leffingwell Chemical Co.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Box 1880, 111 So. Berry St.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Brea, CA 92621</td>
<td></td>
<td></td>
</tr>
<tr>
<td>J.R. Strom</td>
<td></td>
<td></td>
</tr>
<tr>
<td>714-529-3973</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Loveland Ind. Inc.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2307 W. 8th, P.O. Box 906</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Loveland, CO 80537</td>
<td></td>
<td></td>
</tr>
<tr>
<td>303-687-6620</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maag Agrochemicals</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hoffman-LaRoche Inc.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nutley, NJ 07110</td>
<td></td>
<td></td>
</tr>
<tr>
<td>201-235-3633</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mallinckrodt Inc.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>P.O. Box 5439</td>
<td></td>
<td></td>
</tr>
<tr>
<td>St. Louis, MO 63147</td>
<td></td>
<td></td>
</tr>
<tr>
<td>314-895-5043</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Menardi Southern Corp.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>P.O. Box 240</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Augusta, GA 30903</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Skip Peterson</td>
<td></td>
<td></td>
</tr>
<tr>
<td>404-724-8241</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Merck &amp; Co., Inc.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>P.O. Box 2000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rahway, NJ 07065</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
5. Seed Companies

J & L Adikes, Inc., Jamaica NY 11423

Agricultural Service Corp.
P.O. Box 101
Harrisburg, OR 97446
503-955-6124

E J Burlingham & Sons, P.O. Box 217, Forest Grove OR 97116 503-357-2141
Ernst Crownvetch Farms, RD 5, Meadville PA 16335
Grasslyn, Inc., Box AA, College Pk., MD 20740 301-864-0094
Jonathan Green & Sons, Farmingdale, NJ 07727
Great Western Seed Co., Albany OR 97321 503-265-2636
Herbst Bros. Seedsmen
1000 N. Main St.
Brewster, NY 10509
Highland Bentgrass Assn., 2111 Front St., NE, Salem OR 97303
George Hill & Co.
8010 Dixie Hwy, U.S. 25
Florence, KY 41042
606-371-8423
International Seeds Inc., P.O. Box 168, Halsey OR 97348 503-369-2251

3230 Brookfield
Houston, TX 77045
713-433-7281

Woodbury Chem. Co.
P.O. Box 4319
Princeton, FL 33032
305-247-0542

Wyco International
4811 Carnegie Ave.
Cleveland, OH 44103
Dottie Steinback
216-391-5047

Zocon Ind.
975 California Ave.
Palo Alto, CA 94306

3M Co. Agrichemical
3M Center, Bldg. 223-65
St. Paul, MN 55101
612-733-9758

Jacklin Seed Co., Rt 2, Box 402, Post Falls ID 83854

Lofts Pedigreed Seed Co., P.O. Box 146, Bound Brook NJ 08805 201-356-8700
Loft Kellogg Seed Co., Milwaukee WI 53201 414-276-0370
Lofts/New England, Salem OR 97303 503-955-6124
Lofts/New York, Albany NY 12205 518-456-0042
Lynnville Seed Co., Lynnville, IA 50153

Mangelsdorf Seed Co.
Box 327
St. Louis, MO 63166
314-635-6700

Manhattan Ryegrass Growers, 1349 Capitol St. NE, Salem OR 97303

Midwestern States Fescue Assn., 149 Park Central, Springfield, MO 65806
National-NK Seeds Ltd., Box 485, Kitchener, Ontario

North American Plant Breeders, P.O. Box 2955, Mission KS 66205

Northrup King Co., P.O. Box 959, Minneapolis, MN 55440

Oregon Fine Fescue Comm., 1349 Capitol St NE, Salem OR 97303

Osceo Ltd., Box 219, Brampton, Ontario, Canada 416-457-5080
Otto Pick & Sons Seeds Ltd., Box 126, Richmond Hill, Ontario L4C 4X9 416-884-1147
Box 4, R.R.2, Winnipeg, Manitoba R3C 2E6 204-633-0088
Box 151, St. Hyacinthe, Quebec J2S 5J9 514-799-4586
Penncross Bentgrass Assn., 1349 Capitol St. NE, Salem OR 97303

Pennfine Perennial Ryegrass, P.O. Box 923, Minneapolis MN 55440

Pickseed West Inc., P.O. Box 888, Tanger OR 07398 503-8886
Seed Companies

continued

Rothwell Seeds Ltd., Box 511, Lindsay Ontario
O. M. Scotts & Sons, Marysville OH 43040
800-543-0006

Seaboard Seed Co.
P.O. Box 117
Bristol, IL 60512
312-553-5801

Seed Production Introduction
Corp. (SPIC)
1500 Jackson St. NE
Minneapolis, MN 55413

Stanford Seed Co.
809 North Bethlehem Pike
Spring House, PA 19477

Arizona
Alstate Irrigation (Thompson Mfg. Co.) Mesa 602-839-8559
Charlie G. Jones, Inc. (Kohler Engine) Phoenix 602-272-5652
Energy People inc. (Stanley) Tucson 602-327-6700
Equipment Sales Co. (Clark) Tucson 602-884-8413
Huber Sales, Inc. (Cushman/OMC-Lincoln) Phoenix 602-955-1731
J. Pickrell Co. (Broyhill) Phoenix
Lawn Equipment Co. (Clark) Lake Havasu City 602-855-2377
Lawn & Garden Supply Co. (Broyhill, Olathe, Royer) Tucson 602-294-3177
The Norton Corporation (Toro, Lindy, E. Myers Equipment,) Tucson 520-884-2691

Arkansas
Clarklift of Arkansas. Inc. (Clark) El Dorado 501-392-2873
Clarklift of Arkansas, Inc. (Clark) Fordyce 501-928-3800
Clarklift of Arkansas, Inc. (Clark) Fort Smith 501-928-3800
Clarklift of Arkansas, Inc. (Clark) Little Rock 501-562-1262
Dealers Truck Equipment (Stanley) No. Little Rock 501-945-7117
Durivans Inc. (Clark) Springdale 501-756-6193
Falls Equipment Co. Inc. (Clark) Wynne 501-258-3232
Indio Pipe & Supply (Thompson Mfg. Co.) Indio 714-637-4289
Vermeer of Arkansas, Inc. (Vermeer) Alexander 501-847-9388

California
A-Turf (Thompson Mfg. Co.) Orange 714-633-3214
A-Turf (Thompson Mfg. Co.) Canoga 213-884-1180
A-Turf (Thompson Mfg. Co.) Gardena 310-529-4270
A-Turf (Thompson Mfg. Co.) Loma Linda 714-824-7000
Bay Irrigation (Thompson Mfg. Co.) Concord 415-825-9411
Bishop Company (Thompson Mfg. Co.) Whittier 213-723-1522
Al Asher & Sons, Inc. (Olathe) Los Angeles 213-225-6925
Brisbane Respiratory (Foxcroft) St. Petersburg 213-347-3131
Crosby Wholesale (Johnson) San Francisco 415-697-0794

Connecticut
Chuck Farum, Turf Specialist (Richway Products) Stamford 203-327-2537

Colorado
Acme Precision Inc. (Stanley) Denver 303-623-7406
Bandera Equipment (Foxcroft) Commerce City 303-859-5793
Bickle-Selligent, Inc. (Bellingham) Wellington
Boyd Distributing Co. (E. Myers Equipment, Olathe, Royer) Denver 303-629-7701
Central Colorado Equipment Co. (Clark) Colorado Springs 303-475-1100
CPS Distributors, Inc. (Century Farm) Denver 303-744-6371 (Sedalia)
Empire Bobcat Inc. (Clark) Wheat Ridge 303-475-1100
Farm Equipment Distributors (Rhino) Denver 303-735-2043
Gas Equipment Co. of Colorado (Broyhill) Wheat Ridge
Golf Carts Inc. (Cushman/OMC-Lincoln) Denver 303-399-3565
Larimer Co. Equipment Co. (Clark) San Mateo 415-948-2651
Vermeer-California Inc. (Vermeer) Denver 303-796-1191
Waraco Inc. (Mott Corp.) Rosemead 213-283-3544
Western Lawn Equipment Co. (Hahn) San Mateo 415-342-8322
West Point Inc. (Broyhill, Hahn, Lindig) Long Beach 213-432-6954
Zorringer Equipt. (Broyhill) Stockton

Weeds Tress & Turf/Sepetember 1980
<table>
<thead>
<tr>
<th>Location</th>
<th>Company Name</th>
<th>Address</th>
<th>Phone Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Delaware</td>
<td>Delaware</td>
<td>1201 South 3rd St, Wilmington 302-576-4623</td>
<td>302-576-4623</td>
</tr>
<tr>
<td>Florida</td>
<td>Florida</td>
<td>2301 South 4th St, Fort Lauderdale 305-946-3620</td>
<td>305-946-3620</td>
</tr>
<tr>
<td>Hawaii</td>
<td>Hawaii</td>
<td>1234 South 6th St, Honolulu 808-449-4721</td>
<td>808-449-4721</td>
</tr>
<tr>
<td>Idaho</td>
<td>Idaho</td>
<td>1234 South 7th St, Boise 208-333-4567</td>
<td>208-333-4567</td>
</tr>
<tr>
<td>Illinois</td>
<td>Illinois</td>
<td>1234 South 8th St, Chicago 312-222-3333</td>
<td>312-222-3333</td>
</tr>
<tr>
<td>Indiana</td>
<td>Indiana</td>
<td>1234 South 9th St, Indianapolis 317-222-4444</td>
<td>317-222-4444</td>
</tr>
<tr>
<td>Iowa</td>
<td>Iowa</td>
<td>1234 South 10th St, Des Moines 515-222-5555</td>
<td>515-222-5555</td>
</tr>
<tr>
<td>Kansas</td>
<td>Kansas</td>
<td>1234 South 11th St, Kansas City 816-222-6666</td>
<td>816-222-6666</td>
</tr>
<tr>
<td>Kentucky</td>
<td>Kentucky</td>
<td>1234 South 12th St, Lexington 859-222-7777</td>
<td>859-222-7777</td>
</tr>
<tr>
<td>Louisiana</td>
<td>Louisiana</td>
<td>1234 South 13th St, New Orleans 504-222-8888</td>
<td>504-222-8888</td>
</tr>
<tr>
<td>Maine</td>
<td>Maine</td>
<td>1234 South 14th St, Portland 207-222-9999</td>
<td>207-222-9999</td>
</tr>
<tr>
<td>Maryland</td>
<td>Maryland</td>
<td>1234 South 15th St, Baltimore 410-222-0000</td>
<td>410-222-0000</td>
</tr>
<tr>
<td>Massachusetts</td>
<td>Massachusetts</td>
<td>1234 South 16th St, Boston 617-222-1111</td>
<td>617-222-1111</td>
</tr>
<tr>
<td>Michigan</td>
<td>Michigan</td>
<td>1234 South 17th St, Detroit 313-222-2222</td>
<td>313-222-2222</td>
</tr>
<tr>
<td>Minnesota</td>
<td>Minnesota</td>
<td>1234 South 18th St, Minneapolis 612-222-3333</td>
<td>612-222-3333</td>
</tr>
<tr>
<td>Mississippi</td>
<td>Mississippi</td>
<td>1234 South 19th St, Jackson 601-222-4444</td>
<td>601-222-4444</td>
</tr>
<tr>
<td>Missouri</td>
<td>Missouri</td>
<td>1234 South 20th St, St. Louis 314-222-5555</td>
<td>314-222-5555</td>
</tr>
<tr>
<td>Montana</td>
<td>Montana</td>
<td>1234 South 21st St, Billings 406-222-6666</td>
<td>406-222-6666</td>
</tr>
<tr>
<td>Nebraska</td>
<td>Nebraska</td>
<td>1234 South 22nd St, Lincoln 402-222-7777</td>
<td>402-222-7777</td>
</tr>
<tr>
<td>Nevada</td>
<td>Nevada</td>
<td>1234 South 23rd St, Las Vegas 702-222-8888</td>
<td>702-222-8888</td>
</tr>
<tr>
<td>New Hampshire</td>
<td>New Hampshire</td>
<td>1234 South 24th St, Manchester 603-222-9999</td>
<td>603-222-9999</td>
</tr>
<tr>
<td>New Jersey</td>
<td>New Jersey</td>
<td>1234 South 25th St, Newark 877-222-7777</td>
<td>877-222-7777</td>
</tr>
<tr>
<td>New Mexico</td>
<td>New Mexico</td>
<td>1234 South 26th St, Albuquerque 505-222-8888</td>
<td>505-222-8888</td>
</tr>
<tr>
<td>New York</td>
<td>New York</td>
<td>1234 South 27th St, New York 212-222-2222</td>
<td>212-222-2222</td>
</tr>
<tr>
<td>North Carolina</td>
<td>North Carolina</td>
<td>1234 South 28th St, Charlotte 704-222-3333</td>
<td>704-222-3333</td>
</tr>
<tr>
<td>North Dakota</td>
<td>North Dakota</td>
<td>1234 South 29th St, Fargo 701-222-4444</td>
<td>701-222-4444</td>
</tr>
<tr>
<td>Ohio</td>
<td>Ohio</td>
<td>1234 South 30th St, Columbus 614-222-5555</td>
<td>614-222-5555</td>
</tr>
<tr>
<td>Oklahoma</td>
<td>Oklahoma</td>
<td>1234 South 31st St, Oklahoma City 405-222-6666</td>
<td>405-222-6666</td>
</tr>
<tr>
<td>Oregon</td>
<td>Oregon</td>
<td>1234 South 32nd St, Portland 503-222-7777</td>
<td>503-222-7777</td>
</tr>
<tr>
<td>Pennsylvania</td>
<td>Pennsylvania</td>
<td>1234 South 33rd St, Philadelphia 215-222-8888</td>
<td>215-222-8888</td>
</tr>
<tr>
<td>Rhode Island</td>
<td>Rhode Island</td>
<td>1234 South 34th St, Providence 401-222-9999</td>
<td>401-222-9999</td>
</tr>
<tr>
<td>South Carolina</td>
<td>South Carolina</td>
<td>1234 South 35th St, Charleston 843-222-5555</td>
<td>843-222-5555</td>
</tr>
<tr>
<td>South Dakota</td>
<td>South Dakota</td>
<td>1234 South 36th St, Sioux Falls 605-222-6666</td>
<td>605-222-6666</td>
</tr>
<tr>
<td>Tennessee</td>
<td>Tennessee</td>
<td>1234 South 37th St, Nashville 615-222-7777</td>
<td>615-222-7777</td>
</tr>
<tr>
<td>Texas</td>
<td>Texas</td>
<td>1234 South 38th St, Dallas 214-222-3333</td>
<td>214-222-3333</td>
</tr>
<tr>
<td>Utah</td>
<td>Utah</td>
<td>1234 South 39th St, Salt Lake City 801-222-4444</td>
<td>801-222-4444</td>
</tr>
<tr>
<td>Vermont</td>
<td>Vermont</td>
<td>1234 South 40th St, Burlington 802-222-5555</td>
<td>802-222-5555</td>
</tr>
<tr>
<td>Virginia</td>
<td>Virginia</td>
<td>1234 South 41st St, Richmond 804-222-6666</td>
<td>804-222-6666</td>
</tr>
<tr>
<td>Washington</td>
<td>Washington</td>
<td>1234 South 42nd St, Seattle 206-222-7777</td>
<td>206-222-7777</td>
</tr>
<tr>
<td>West Virginia</td>
<td>West Virginia</td>
<td>1234 South 43rd St, Charleston 304-222-8888</td>
<td>304-222-8888</td>
</tr>
<tr>
<td>Wisconsin</td>
<td>Wisconsin</td>
<td>1234 South 44th St, Madison 608-222-9999</td>
<td>608-222-9999</td>
</tr>
<tr>
<td>Wyoming</td>
<td>Wyoming</td>
<td>1234 South 45th St, Cheyenne 307-222-7777</td>
<td>307-222-7777</td>
</tr>
</tbody>
</table>
It’s your turf. Keep it free of crabgrass, Poa annua and other annual grasses and weeds with America’s leading preemergence herbicide for turf.

Dacthal
Dacthal is number one in its field. Not only because it is so effective, but because it controls more than 20 unwanted weeds and grasses. Applied properly, it lays down a barrier that stops early and late germinating annual weeds without affecting healthy, growing turf grasses. Tough weeds like crabgrass and Poa annua can’t stand up to Dacthal.

The help you need for total turf care.

Dacamine® provides post-emergence control of over 70 broadleaf weeds, including dandelion, annual chickweed, knotweed and Canada thistle. It works right down to the roots so tough perennials don’t return.

Daconate® is the postemergence herbicide that knocks out nutsedge, chickweed, wood sorrel, sandbur and other grassy weeds. It’s a ready-to-use liquid herbicide with a built-in surfactant for uniform wetting.

Daconil 2787® is the broad-spectrum fungicide that stops nine fungus diseases on greens and fairways. Use it from spring to fall to prevent dollar spot, leaf spot, red thread, stem rust of blue grass, large brown patch. It’s effective even in hot weather. Provides effective disease control on a number of ornamentals.

Count on the big four from Diamond Shamrock to make your job easier.

Diamond Shamrock
The resourceful company.

Write 110 on reader service card
<table>
<thead>
<tr>
<th>Company Name</th>
<th>City/Location</th>
<th>Phone Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Century Toro Distrib. (Cushman/OMC-Lincoln)</td>
<td>Memphis</td>
<td>901-942-3206</td>
</tr>
<tr>
<td>Bob Ladd &amp; Assoc. (Inc.) (Cushman/OMC-Lincoln)</td>
<td>Memphis</td>
<td>901-324-1130</td>
</tr>
<tr>
<td>Liles &amp; Tipp Inc. (F. E. Myers Equip., Hahn)</td>
<td>Collinville</td>
<td>901-853-0246</td>
</tr>
<tr>
<td>Tennessee Diesel Motor Co. (Cushman/OMC-Lincoln)</td>
<td>Nashville</td>
<td>615-255-7331</td>
</tr>
<tr>
<td>Turn Distributors Inc. (Cushman/OMC-Lincoln, F. E. Myers Equip.)</td>
<td>Knoxville</td>
<td>615-522-1141</td>
</tr>
</tbody>
</table>
| Tennessee Equipment of Newport (Lincoln, OMC), Royce (Royce, 
Fargo) | Sioux Falls | 701-225-4433 |
| United Equipment (Stanley) Memphis 901-361-3718 | Memphis        | 901-656-3296 |
| Vermeer-Memphis, Inc. (Vermeer) Memphis 901-355-4835 | Memphis        | 901-656-3296 |
| Iowa Tractor Sales (Cushman/OMC-Lincoln) | Des Moines     | 515-255-1511 |
| Vermeer-Memphis, Inc. (Vermeer) | Des Moines     | 515-255-1511 |
| The Bill Voorhees Co. (Satoh) Nashville 615-242-4483 | Nashville  | 615-242-4483 |
| Wallace Hardware Co., Inc. (Century Farm, 
Lincoln, Howard Price) | Dallas        | 214-976-7781 |
| Wilson, Weesner & Wilkinson | Dallas        | 214-515-1411 |
| Wilson, Weesner & Wilkinson (Stanley) Chantoapoa 615-266-6739 | Indianapolis  | 315-563-8076 |
| Wilson, Weesner & Wilkinson (Stanley) Nashville 615-254-1511 | Memphis        | 901-584-5793 |
| Binnon & Assoc., Inc. (Howard Price) 
Amariot 606-352-0891 | Kansas City  | 913-889-1111 |
| Boysy Equipment, Inc. (BooMy) 
Amarillo Chemical & Turf Specialty Co. (Royer, F. E. Myers Equip.) Dallas | Amarillo    | 762-777-3561 |
| E. E. Myers Equip., Hahn) San Antonio 918-541-2128 | San Antonio   | 901-324-1130 |
| Goldthwaite's of Texas, Inc. 
(Howard Price) Dallas 615-966-4323 | Dallas        | 615-966-4323 |
| Goldthwaite's of Texas, Inc. 
(Howard Price) Dallas 214-341-3010 | Dallas        | 214-341-3010 |
| Goldthwaite's of Texas, Inc. (Royer) San Antonio 512-653-9660 | San Antonio   | 615-966-4323 |
| Goldthwaite's of Texas, Inc., Royce 
(Howard Price) Waco 817-332-1521 | Waco          | 817-332-1521 |
| Hydro Irrigation (Thompson Mfg. Co.) Dallas 
214-358-1228 | Dallas        | 214-358-1228 |
| Outdoor Equipment Co. (Hahn) Houston 713-784-2566 | Houston       | 713-784-2566 |
| Peebles Equipment Corp. (Stanley) Dallas 
214-351-3704 | Dallas        | 214-351-3704 |
| Peerless Equipment Corp. (Stanley) | Longview     | 515-218-0727 |
| Vermeer-Memphis, Inc. (Vermeer) | Memphis        | 901-355-4835 |
| Russ & Co. (Broyhill) Littlefield | Austin         | 512-332-5991 |
| Russell Supply Co. (Broyhill) 
Lubbock 806-348-6999 | Lubbock       | 806-348-6999 |
| T & C Equipment Co. (Howard Price) | Lubbock       | 806-348-6999 |
| The Stewart Co. (Satoh) Dallas 214-691-5555 | Dallas        | 214-691-5555 |
| Vermeer Sales & Service (Vermeer) | Lubbock       | 806-762-5069 |
| Vermeer Sales & Service (Texas, Olathe) | Olathe         | 913-449-9000 |
| Vermeer Sales & Service (Texas, San Antonio) | San Antonio   | 210-322-3373 |
| Ware Implement Distributors (Century Farm) | San Antonio  | 512-732-5991 |
| Watson Distributing Co. (Lincoln, 
Rothaber) Dallas 214-341-3010 | Dallas        | 214-341-3010 |
| Watson Distributing Co. (Lincoln, 
Rothaber) Dallas 214-341-3010 | Dallas        | 214-341-3010 |
| Dean Deere & Co. (Deere) | 512-968-3464 | 512-968-3464 |
| T & C Equipment Co. (Howard, Broyhill) | Hurst          | 817-268-2406 |
| The Stewart Co. (Satoh) Dallas 214-691-5555 | Dallas        | 214-691-5555 |
| Vermeer Sales & Service (Vermeer) | Lubbock       | 806-762-5069 |
| Vermeer Sales & Service (Texas, Olathe) | Olathe         | 913-449-9000 |
| Vermeer Sales & Service (Texas, San Antonio) | San Antonio   | 210-322-3373 |
| Ware Implement Distributors (Century Farm) | San Antonio  | 512-732-5991 |
| Watson Distributing Co. (Lincoln, 
Rothaber) Dallas 214-341-3010 | Dallas        | 214-341-3010 |
| Watson Distributing Co. (Lincoln, 
Rothaber) Dallas 214-341-3010 | Dallas        | 214-341-3010 |
| Dean Deere & Co. (Deere) | 512-968-3464 | 512-968-3464 |
| T & C Equipment Co. (Howard, Broyhill) | Hurst          | 817-268-2406 |
| The Stewart Co. (Satoh) Dallas 214-691-5555 | Dallas        | 214-691-5555 |
| Vermeer Sales & Service (Vermeer) | Lubbock       | 806-762-5069 |
| Vermeer Sales & Service (Texas, Olathe) | Olathe         | 913-449-9000 |
| Vermeer Sales & Service (Texas, San Antonio) | San Antonio   | 210-322-3373 |
| Ware Implement Distributors (Century Farm) | San Antonio  | 512-732-5991 |
| Watson Distributing Co. (Lincoln, 
Rothaber) Dallas 214-341-3010 | Dallas        | 214-341-3010 |
| Watson Distributing Co. (Lincoln, 
Rothaber) Dallas 214-341-3010 | Dallas        | 214-341-3010 |
| Dean Deere & Co. (Deere) | 512-968-3464 | 512-968-3464 |
| T & C Equipment Co. (Howard, Broyhill) | Hurst          | 817-268-2406 |
| The Stewart Co. (Satoh) Dallas 214-691-5555 | Dallas        | 214-691-5555 |
Groundsmaster 72.
We engineered this Professional to mow up to 3.7 acres an hour without losing its cool.

If you're responsible for large areas of turf, you have grounds to buy our Groundsmaster 72®.
In fact, Toro engineered this rugged 72" rotary specifically for your needs.
We built-in plenty of power for all types of cutting conditions.
We made its engine water cooled to give you longer service life.
We designed it to trim close to fences, walls, buildings and trees.
And we added versatility. With optional accessories including a 48" snowthrower, V-plow, rotary broom, roll over protection system (ROPS), and cab with ROPS.

Want a demonstration of the Groundsmaster 72®? Or our Groundsmaster 52® that mows like a garden tractor and trims close like a walk mower? Call your Toro distributor. Or, mail the coupon.

Tell me more, Toro.
I'm interested in a free demonstration of the Groundsmaster 72®. Please have my distributor call me.

Name
Company
Address
City       County
State      Zip
Phone
area code  number

Mail coupon to: The Toro Company
Commercial Marketing Dept. WTT-090 8111 Lyndale Ave. S., Minneapolis, MN 55438

Write 142 on reader service card
Singlehanded, you can whip fuel and labor costs with EXCEL HUSTLER pure motion at your fingertips.

To groundskeeping pros, EXCEL HUSTLER means Mower—and More—every season.

Two hydrostatic pumps transmit direct to drive wheels instantly in response to fingertip touch on twin hand levers. Dual pumps work only half as hard, last many seasons longer for added value and less downtime. But there’s More: instant pure motion moves the big mowers easily around trees, park benches, markers, and other mowing headaches. EXCEL HUSTLER owners mow More acres per hour, More grass per gallon, More years per mower!

The Mower delivers a super cut on fine turf or rough. Choose air-cooled 275 or 285, liquid cooled 295. Standard or heavy duty 72" rotary, 54" rotary, or 60" flail.

More turf and grounds attachments: Cultivator, Catcher/Compactor, Edger, Dozer Blade, Rotary Broom, amazingly efficient Snow Thrower. Add ROPS; enclose cab for winter comfort; Tilt-Deck Trailer for transporting.

And More! Factory trained service and parts through your EXCEL HUSTLER Distributor. Write or call for his name and free literature, or watch for a field demo.

GSA: GS-07S-04916  HUD: OPH (CO)m-2930

Mower and More, the choice of the pros.

Excel Industries, Inc. • Box 727 • Hesston, Kansas 67062 • (316) 327-4911 • (800) 835-3260

Write 121 on reader service card
The only way to improve was to lower the price.

So we did!

Now, no matter how much (or how little) Baron you buy, you'll pay 1/2 less than before. It's our way to thank you for making Baron the world's largest selling bluegrass.

It's possible because, unlike other elite bluegrasses, Baron consistently produces large quantities of seed. And that means Baron is always available.

It's still the same great Baron...with the same quick germination, dense growth and rich color that looks great in sun or shade. It resists diseases and requires minimal fertilization. And, of course, it's certified and free of both Poa annua and bentgrass.

Baron is still the same. Only the price is lower! $1.49/lb.

*Gold Tag (sod quality) is available at $1.59 per pound. Prices slightly higher in Canada. These new crop prices available September 1, 1980.
Drainage

Waterlogged or submersed turfgrass can be severely damaged in less than two weeks, longer during dormancy. Standing water should be eliminated by filling in low spots, grading to control surface runoff, or installation of drainage tile. If drain tile is the choice, they should be installed in a branched pattern 15 to 30 feet apart with a minimum slope of .5 to 1 percent, at a depth of two to three feet, shallower in sandy soils. The best backfill is washed sand to the surface. If the subgrade is relatively impervious to water, but lower layers are fine, drilling or shallow slit trenches may solve the problem.

If major modification of the rootzone is planned, subgrades can be sloped toward spaced tile or perforated plastic pipe for even distribution of drainage. Rootzone designs usually call for coarse sand over the tile with a layer of topsoil on top mixed to specified texture. Drainage may also be impaired by thatch, hydrophobic soils, and hard water. Thatch removal, soil aeration, and water conditioners can improve infiltration. Depth of topsoil affects drainage since shallow layers of topsoil will tend to saturate faster than deeper layers.

For proper surface drainage slopes should be more than one percent but no more than 20 percent.

Shade

Turfgrass cannot be healthy under conditions of light stress. It requires enough light for photosynthesis to produce the needed quantity of carbohydrates for plant growth and...
maintenance. Furthermore, plants prefer blue regions of light to others. The intensity of the light may be limited by the time of day the plant receives full sun, the angle of the plant surface to the sun, and the length of time the plant is exposed to sunlight.

Excessive shade causes reduced growth, reduced spreading by stolons and rhizomes, limited root growth, depletion of carbohydrate storage, less wear tolerance, and thinner turfgrass stands.

Other factors of excessive shade are high surface humidity encouraging disease, lower soil temperatures likely to delay emergence from winter dormancy, and competition with trees for nutrients. Creeping red fescue and velvet bentgrass are most shade tolerant of cool season turfgrasses. *Poa trivialis*, creeping bentgrass, and tall fescue have fair shade tolerance. Kentucky bluegrasses are notably shade intolerant, however, some cultivars exhibit improved shade tolerance such as Clade and Warren's A-34.

St. Augustinegrass is followed by zoysiagrass in shade tolerance in warm season turfgrasses. Bermudagrass is also notably shade intolerant. Removal of lower branches and thinning of limbs is one alternative to removing entire trees to obtain more light. Use of turfgrass in areas of permanent shade is fruitless, such as northeast corners of buildings or walls.

**Air Circulation**

Trees and structures can restrict air circulation over turf areas. Turfgrass releases moisture by transpiration through leaves. If this moisture, heavy dew or moisture from rainfall or irrigation is not controlled, the environment for many turf diseases is improved. That is why morning irrigation is favored over evening irrigation. Air movement helps moderate early afternoon soil temperatures for grasses in full sun.

On the other hand, too much wind can desiccate exposed leaf surfaces, increase the chance of winterkill, and prevent adequate moisture from reaching the soil. As mentioned earlier, shortage of carbon dioxide on the soil surface is rarely a problem.

**Irrigation**

If fine turf is the objective, irrigation of some form should be included in the site plan. Discussion with the customer or landscape architect will establish the commitment by the owner for fine turf. Without irrigation the customer can expect periods of summer dormancy, eventual transition to more drought tolerant and low fertility tolerant grasses such as tall or red fescue, and less control over seed germination after planting.

James Watkins writes in his book TURF IRRIGATION MANUAL that the relative cost of irrigation system choices is in a ratio of 4:2:1 (spray systems: rotary systems; and quick coupler systems). He advises that cost is only one consideration and each type of system should be evaluated for a particular site.

At least, an irrigation design consultant should evaluate site drawings for approximate cost and water requirements. A well may be needed or a pump system for a lake. Today, irrigation installation is considerably less disruptive to a site. Vibratory plows and plastic pipe greatly reduce turf damage.

Drip irrigation is an alternative to shrub heads for some sites. The drip lines cannot withstand surface disturbance. If an underground system is installed for the turf, an extra zone for shrubs may be more practical than a separate drip system.

Extra care during seeding or sodding is required around irrigation heads. Heads should be properly installed to prevent puddling around heads and to assure clearance of turf after installation. Controls, pumps and valves should be secured to prevent vandalism or theft.

The landscape contractor should find a reputable irrigation designer to handle subcontracts. A good relationship will help the installation look its best for a long period of time. The customer must be clearly apprised of the maintenance needs of the irrigation system and the proper use for good turf care.
<table>
<thead>
<tr>
<th>Title</th>
<th>Quantity</th>
<th>Price</th>
<th>Total Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>TREE FARM BUSINESS</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>by James Vardaman</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A guide to help you increase profits from tree</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>farming. Major problems confronting large</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>and small tree farms and how to meet them</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>including recommendations for seeking out</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>accountants, lawyers and other professionals.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Price: $16.00</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>GUIDE TO TREES</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>by Simon &amp; Schuster</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Beginner and experts reference to 300 trees</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>with 350 full-color illustrations. This</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>authoritative guide supplies you with a full</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>description of size, color, shape, leaves,</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>flowers, fruit and seeds; information on</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>habitat, propagation and growth conditions</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PLUS a hardiness zone maps, glossary and</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>index.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Price: $19.95 hardback $8.95 paperback</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DISEASES OF TURFGRASSES</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>by Houston Couch</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reference for identification and control of</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>fungus and nematode-incited diseases. This</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2nd edition features new varieties of</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>potentially hazardous turfgrass diseases, also</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>pesticide regulation changes and more</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>efficient fungicides on the market.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Price: $27.00</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MANUAL OF WOODY LANDSCAPE PLANTS</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>by Michael Dirr</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A teaching text and reference on ornamental</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>deciduous trees, shrubs, ground cover and</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>vines. Provides identification characteristics</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>with ornamental and cultural features all in</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>one volume.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Price: $19.00</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SHRUB IDENTIFICATION</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>by George Symonds</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pictorial key to identify shrubs. Contains</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>more than 3,500 illustrations to check</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>specimens. Popular and botanical names are</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>given for each shrub with handy index tabs</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>for quick reference.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Price: $18.00 hardback $8.00 paperback</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TREE SURGERY</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>by P.H. Bridgeman</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>This practical guide to equipment and</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>operation methods attempts to give an up-to-</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>date picture of the modern industry. Includes</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>illustrative photographs and detailed line</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>drawings.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Price: $17.00</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SOILS &amp; SOIL FERTILITY</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>by Thompson and Troeh</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fourth edition. Comprehensive textbook and</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>reference guide for the study of soil</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>fertility and soil science. Several chapters</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>devoted to specific soil amendments, soil</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>management and conservation.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Price: $20.00</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>WEED SCIENCE</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>by Glenn C. Klingman, Floyd M. Ashton</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Source for those concerned with weeds. Thoroughly indexed, tabled and illustrated. Effective classroom aid and research reference. Explains more than 100 herbicides, their uses. Includes chapters on soil sterilants and total vegetation control.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Price: $20.00</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>FUNDAMENTALS OF ENTOMOLOGY AND PLANT PATHOLOGY</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>by Louis L. Pyenson</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Limited to the study of insects, related</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>forms, nematode and plant pathogens. Discusses</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>nature and control of these pests in a simple</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>and concise fashion.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Price: $21.00</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SOILS AND OTHER GROWTH MEDIA</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>by A.W. Flegmann, Raymond George</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Presenting a modern view of the chemical and</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>physical aspects of soils as the environment</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>of plant roots on a molecular scale, together</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>with an up-to-date evaluation of field soils</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>and currently used growth media.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Price: $10.00</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>THE PRUNING MANUAL</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>by Everett P. Christopher</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Latest information on pruning fruit and shade</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>trees, ornamental shrubs and roses. 100</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>diagrams and photographs. Sections also</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>devoted to forestry, grafting, root pruning,</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>wound treatment and tools.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Price: $10.00</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Mail to: Book Dept.
Harvest Business Publications
9800 Detroit Avenue
Cleveland, OH 44102

Name ____________________________
Address ____________________________
City ____________________________ State ______ Zip ______
Acct. No. ____________________________
Expiry Date ____________________________

Signature ____________________________

Please send the following books. I have enclosed a check or authorized a charge for the total amount.

<table>
<thead>
<tr>
<th>Title</th>
<th>Quantity</th>
<th>Price</th>
<th>Total Price</th>
</tr>
</thead>
</table>

Add $1.25 per book for handling and shipping.

Total enclosed ____________________________
Soil Preparation

The most common state of a site when the contractor arrives is the topsoil has been replaced and rough graded. It is not unusual for the contractor to see the need for further grading, backfilling curbs, foundations, and perhaps trenches that have settled; and additional topsoil where needed.

If topsoil has not been replaced, the contractor has the opportunity to amend and mix the topsoil to optimum conditions. A soil shredder or mixer can simplify this task. He also has the opportunity to grade the subsoil for improved drainage if necessary.

Musser and Perkins of Pennsylvania State University recommend in TURFGRASS SCIENCE that the topsoil mix consist of one part peat, four parts sand, and five parts topsoil. It should be well mixed and spread to a depth of at least six inches.

If topsoil is already in place, amendments can be added and mixed with a cultivator. Overworking the soil can break down aggregates and destroy the soil texture. Also, soil preparation should not be attempted in wet weather to prevent compaction. Limestone and phosphorus do not leach readily and should be incorporated with the top-

Seeding Rates Recommended.

<table>
<thead>
<tr>
<th>Type</th>
<th>Seeds/lb. (in thousands)</th>
<th>Seeds/in.</th>
<th>Germ. Rate</th>
<th>Lbs. Seed/1,000 sq. ft.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bahiagrass</td>
<td>170</td>
<td>7-9</td>
<td>80%</td>
<td>Beard</td>
</tr>
<tr>
<td>Bentgrass</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Creeping</td>
<td>7,900</td>
<td>30-50</td>
<td>85%</td>
<td>0.5-1</td>
</tr>
<tr>
<td>Colonial</td>
<td>8,750</td>
<td>30-60</td>
<td>85%</td>
<td>0.5-1</td>
</tr>
<tr>
<td>Velvet</td>
<td>11,800</td>
<td>40-80</td>
<td>90%</td>
<td>0.5-1</td>
</tr>
<tr>
<td>Bermudagrass (hulled)</td>
<td>1,800</td>
<td>12-20</td>
<td>85%</td>
<td>1-1.5</td>
</tr>
<tr>
<td>Bluegrass</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kentucky</td>
<td>2,200</td>
<td>15-25</td>
<td>75%</td>
<td>1-1.5</td>
</tr>
<tr>
<td>Rough</td>
<td>2,500</td>
<td>18-25</td>
<td>80%</td>
<td>1-1.5</td>
</tr>
<tr>
<td>Centipedegrass</td>
<td>400</td>
<td>10-15</td>
<td>—</td>
<td>4-6</td>
</tr>
<tr>
<td>Fescue</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chewings</td>
<td>546</td>
<td>15</td>
<td>85%</td>
<td>3.5-4.5</td>
</tr>
<tr>
<td>Creeping Red</td>
<td>550</td>
<td>15</td>
<td>85%</td>
<td>3.5-4.5</td>
</tr>
<tr>
<td>Tall</td>
<td>225</td>
<td>10-15</td>
<td>85%</td>
<td>7-9</td>
</tr>
<tr>
<td>Perennial Ryegrass</td>
<td>225</td>
<td>10-15</td>
<td>—</td>
<td>7-9</td>
</tr>
<tr>
<td>Zoysiagrass</td>
<td>1,400</td>
<td>20-30</td>
<td>—</td>
<td>2-3</td>
</tr>
</tbody>
</table>

Turfgrass Tolerances. 1

<table>
<thead>
<tr>
<th>Type</th>
<th>Shade</th>
<th>Wear</th>
<th>Drought</th>
<th>Cold</th>
<th>Heat</th>
<th>Salt</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bahiagrass</td>
<td>—</td>
<td>good</td>
<td>high</td>
<td>poor</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Bentgrass</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Creeping</td>
<td>good</td>
<td>poor</td>
<td>poor</td>
<td>high</td>
<td>medium</td>
<td>good</td>
</tr>
<tr>
<td>Colonial</td>
<td>medium</td>
<td>poor</td>
<td>poor</td>
<td>good</td>
<td>medium</td>
<td>poor</td>
</tr>
<tr>
<td>Velvet</td>
<td>high</td>
<td>—</td>
<td>poor</td>
<td>good</td>
<td>medium</td>
<td>—</td>
</tr>
<tr>
<td>Bermudagrass</td>
<td>poor</td>
<td>high</td>
<td>high</td>
<td>poor</td>
<td>high</td>
<td>good</td>
</tr>
<tr>
<td>Bluegrass</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kentucky</td>
<td>poor</td>
<td>medium</td>
<td>medium</td>
<td>good</td>
<td>medium</td>
<td>poor</td>
</tr>
<tr>
<td>Rough</td>
<td>good</td>
<td>poor</td>
<td>poor</td>
<td>high</td>
<td>poor</td>
<td>—</td>
</tr>
<tr>
<td>Centipedegrass</td>
<td>medium</td>
<td>poor</td>
<td>poor</td>
<td>high</td>
<td>poor</td>
<td>—</td>
</tr>
<tr>
<td>Fescues</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chewings</td>
<td>low</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>fair</td>
<td>—</td>
</tr>
<tr>
<td>Creeping Red</td>
<td>high</td>
<td>medium</td>
<td>good</td>
<td>medium</td>
<td>fair</td>
<td>poor</td>
</tr>
<tr>
<td>Tall</td>
<td>good</td>
<td>good</td>
<td>good</td>
<td>medium</td>
<td>good</td>
<td>medium</td>
</tr>
<tr>
<td>Perennial Ryegrass</td>
<td>medium</td>
<td>medium</td>
<td>fair</td>
<td>poor</td>
<td>fair</td>
<td>medium</td>
</tr>
<tr>
<td>St. Augustine</td>
<td>high</td>
<td>medium</td>
<td>fair</td>
<td>poor</td>
<td>high</td>
<td>good</td>
</tr>
<tr>
<td>Zoysiagrass</td>
<td>good</td>
<td>high</td>
<td>high</td>
<td>medium</td>
<td>high</td>
<td>good</td>
</tr>
</tbody>
</table>

1. Rated by James Beard, Texas A & M University, College Station, Texas
Protects high wear turf areas. And your reputation.

Some turf can't be pampered. It's there to be used and enjoyed. But this places growing stress on the turf. And stress on your turf growing reputation.

Sydsport is an effective answer. With good seedling vigor and rapid development, Sydsport establishes itself quickly. Active rhizomes promote a very dense rich green turf. Vigorous growth continues late into the season to aid recovery from wear and damage before the turf goes into winter dormacy. Proven winter hardiness brings Sydsport through, ready for another active season.

When you need no-pamper turf, seed Sydsport. Vigorous Sydsport protects high wear turf areas. And turf growing reputations.

E.F. BURLINGHAM & SONS
P.O. Box 217 • Forest Grove, OR 97116
(503) 357-2141 • Telex: 36-0274
Cable: Burlingham
The "Piggyback" Material Handler

It's Powerful ... Safe ... Versatile!

Princeton's mighty "Piggyback" has solved many of the problems that have always plagued heavy-duty, field quality material handlers. The remarkable "Piggyback" is light...strong...fast...durable...AND completely stable on the job!

The Piggyback will lift and load up to 4500 lbs. at a time ... turn quickly in its own length ... navigate curbs, logs, and other obstacles with ease...trudge through gravel, sand and mud, but float over normal soil...and then load itself onto your truck for a piggyback ride home at the end of the day.

How is it Possible?
The Princeton "Piggyback" provides an extremely low ratio of weight to carrying capacity...with complete stability. Stability is achieved by carrying the load weight between the drive wheels instead of in front, as with other fork lifts, and by special hydraulic stabilizer legs. Load is lifted to truck bed height, then rolled over truck bed by a horizontal carriage. Heavy-duty high torque wheel motors allow the "Piggyback" to operate on steep grades or in adverse ground conditions and to drive easily over normal loading area obstructions while fully loaded.

The Piggyback's 28 h.p. Murphy 2-cylinder diesel provides superior power for all adverse operating conditions.

Loaded for Piggyback ride home.

For additional information or demonstration, write, or call collect:

Rodger Osborne, Sales Manager
955 W. Walnut St., Canal Winchester, Ohio 43110
(614) 837-9096

Dealer/Distributor Inquiries Invited

The "New Concept" People

Sod Production and Topsoil Loss

The present day concern over topsoil loss to erosion has expanded in some areas to a concern over soil depletion by sod production. If fact, some sod producers claimed soil depletion allowances in 1978 before the American Sod Producers Association convinced Congress that such allowances did not fit the practice of harvesting sod. Had ASPA not obtained this exemption for sod producers, they would have been forced to implement an inventory system of accounting for tax purposes.

Great strides have been made in reducing sod thickness over the last 20 years. Researchers and sod growers have proven the benefits of thinner sod. Thinner sod roots more rapidly and cuts transportation and handling costs. Sod thickness is today primarily a function of sod strength. Knives are set just low enough to prevent scalping on uneven spots in the fields.

Research by Skogley and Hesseltine at the University of Rhode Island has identified harvesting method and the age of a stand as the main factors in sod thickness. Three-year-old sod could be cut at slightly thinner thicknesses than two-year-old sod. The machinery's ability to handle uneven fields can reduce the thickness further.

Actual blade adjustment may seem minute, but a 1/16-in. higher setting could save six tons of soil loss per acre.

Production of sod, as compared to other agronomic crops, actually improves the organic matter content of the soil by two percent per harvest. This is due to the fact that most of the turfgrass roots remain in the soil after harvesting and decompose.

Skogley and Hesseltine found that sod production removed less topsoil than many other crops. Wind and water erosion are greatly reduced by grass cover as opposed to open crops such as corn, soybeans, and cotton. Planting winter wheat often provides farmers with reduced winter topsoil loss.

Topsoil removed during sod harvesting is less than many conventional agricultural crops.
When this low-growing, Swedish lawn beauty first stepped into the turf world it revolutionized the lawn industry.

Now another step! Fylking Kentucky bluegrass costs less than most other elite bluegrasses!

Fylking establishes fast, develops a greater density of rhizomes and root system. Fine-textured, velvety green, Fylking performs well when cut low (even low as one-half inch), and may need less mowing. Amazingly tough, Fylking Kentucky bluegrass has improved disease resistance to leaf spot, stripe smut, stem rust and leaf rust, as rated in tests by many major universities and institutions. Physically pure, genetically true seed, Fylking contains no annual bluegrass (Poa annua), bent grass or short-awned foxtail.

Take a giant step ahead by using Fylking as the backbone bargain of your next lawn turf mix. Ask for the Swedish beauty, Fylking Kentucky bluegrass at your local wholesale seed or sod distributor.

**FYLKING KENTUCKY BLUEGRASS** U.S. Plant Patent 2887

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

Write 125 on reader service card
New ECLIPSE Kentucky bluegrass was chosen to cover the roof of Central Pre-Mix Concrete Company's new underground, two-level concrete office building. With 8000 square feet on each level, 33% savings on heating costs is expected. No air conditioning is installed because of the earth's 40° to 60° temperature range. A large heat pump utilizes earth cooling and heating. The sprinkler system is controlled by humidity requirements of grass roots.

ECLIPSE Kentucky bluegrass covers the roof and is destined to be a leader. It germinates fast and performs well in sun or shade. Shade test trials proved ECLIPSE better than many varieties on both East and West Coasts. Developed at Rutgers, ECLIPSE has excellent stem rust resistance, improved resistance to the Fusarium blight and the dollarspot disease. Dark green, medium-textured ECLIPSE is a good base for sod blends and turf seed mixtures.

ECLIPSE Kentucky bluegrass seed available exclusively from:

COWBELL SEEDS, INC.
1093 129th St., Bradley, MI 49311
850 N. Old 23, Brighton, MI 48116

GARFIELD-WILLIAMSON
1072 W. Side Ave., Jersey City, NJ 07306

JACKLIN SEED COMPANY
W. 17300 Jacklin Ave., Post Falls, ID 83854

NUNES TURFGRASS, INC.
2006 Loquot Ave., Patterson, CA 95363

TWIN CITY SEED COMPANY
500 30th Ave., N.E., Minneapolis, MN 55418

ROTHWELL SEEDS (In Canada)
P.O. Box 511, Lindsay, Ontario K9V 4S5
soil if soil tests indicate a need. It is also a good time to mix in potassium and minor elements. Nitrogen need not be added at this time.

If there is a delay between rough grading and seeding, weeds will have emerged. Although the process of fine grading will kill most of the weeds, persistent grassy weeds can cause problems later. Most herbicides take two weeks or longer to dissipate after application. Roundup can be used on problem weeds if necessary and will dissipate within three days. Soil fumigants can be used for control of weeds, nematodes and insects if desired. Seed can usually be planted two or three days after fumigation. An advantage of fall seeding for cool-season grasses is the aggressiveness of the turfgrass in relation to broadleaf weeds during cooler, sunny days. Spring seedings face a strong challenge from broadleaf weeds during summer. Spring is often the preferred time for warm season grass seeding.

Just prior to seeding a complete fertilizer should be applied. Approximately one pound of nitrogen per 1,000 square feet can be soluble in form, with the remainder in slow-release form. Enough slow-release nitrogen should be applied to delay a second fertilizer application for six to eight weeks. The starter fertilizer should contain adequate levels of phosphorus and potassium since the seed is close to the surface. The turfgrass won’t take advantage of the phosphorus mixed into the topsoil beforehand until it roots. Phosphorus will not leach or move to the surface.

Seeding

Two overlooked factors in seeding are the number of seeds per pound and the difference between spreading and bunch type grasses. One misconception in seeding is the idea that if one rate is good, a higher rate is better. This is related to the idea that seed is cheap in comparison to proper soil preparation.

A good lawn is constructed like a good house, from the foundation up and with good materials. Short cuts in the beginning cannot be overcome later. Constant repair could keep the lawn alive but can easily exceed site alterations or soil amendment in cost.

Assuming the seedbed was properly constructed, the seed rate should be determined by seed count. Seed count varies according to species and cultivar. (see table). Beard in his textbook TURFGRASS SCIENCE AND CULTURE specifies the number of seeds per square inch for North American species. If that number is applied to the total area of the seedbed and divided by the number of seeds per pound, a seed rate in pounds per acre can be determined. Each component of a mixture can be figured by seed count to derive an appropriate rate for a mixture. Lower rates for spreading grasses can be used. Sod producers often use lower rates for Kentucky bluegrass than a landscape contractor would.

For bunch type turfgrasses, such as tall fescue and perennial ryegrass, seed count, adjusted by germination percentage, should be slightly higher than the number of shoots present in a mature stand. This would mean roughly 15 seeds per square inch for tall fescue and perennial ryegrass, which works out to be about eight pounds per 1,000 square feet. Ken-
Tree Farm Business Management by James Vardaman
Diseases of Shade Trees by Terry Tattar
Guide to Trees by Simon & Schuster
Diseases of Turfgrasses by Houston Couch
Tree Maintenance by Pascal Pirone
Turf Irrigation Manual by James Watkins
Manual of Woody Landscape Plants by Michael Dirr
Diseases and Pests of Ornamental Plants by Pascal Pirone
Diseases of Shade Trees
Guide to Trees
Diseases of Turfgrasses
Tree Maintenance
Turf Irrigation Manual
Guide to Trees
Diseases of Turfgrasses
Tree Maintenance
Turf Irrigation Manual

Please send the following books. I have enclosed a check for the total amount or authorized a charge for the total amount.

<table>
<thead>
<tr>
<th>Title</th>
<th>Unit Price</th>
<th>Quantity</th>
<th>Total Price</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(Allow 6-8 Weeks Delivery. Prices Subject to Change)
Add $1.25 per book for shipping and handling
Total enclosed

Name ____________________________________________
Address _________________________________________
City, State, Zip Code ____________________________
Master Charge or Visa (Circle one)
Acct. No. ____________________________
Expiration Date ____________________________
Signature __________________________________

Mail to: Book Department Harvest Business Publications 9800 Detroit Avenue Cleveland, Ohio 44102
tucky and rough bluegrass can establish satisfactorily at one pound per 1,000 square feet. Bentgrass will succeed at one half pound per 1,000 square feet.

Higher seeding rates can actually cause the turfgrass to crowd itself and to compete for light and nutrients. Weakened seedlings are more prone to disease and insects than seedlings from correct seed rates. The hurry to establish a turf cover may not be worth the weakened turf caused by higher seed rates.

High seed rates are not insurance. The recommended rate is also the cheapest rate. Excessive amounts of seed discourage the use of improved cultivars due to cost. The cost of tall fescue is not a great deal cheaper when the seed rate is multiplied by the cost per pound.

If erosion by rain or wind is a concern with the seed rate, the correction should be in the method of seeding or in the use of mulch rather than the increase in seeding rate. If slopes are extreme, netting or sod should be considered over standard seeding.

For best germination seed should be covered with one quarter to one half inch of soil. Surface seeding is not as effective. Soil retains moisture better than most mulches and supplies the seedling with water following germination. If a mixture of seed is used, a centrifugal seeder will not provide even distribution of all seed types. Drop spreaders or a cultipacker are preferred. The seedbed can be rolled after seeding to improve soil/seed contact.

Many types of mulches are available for water retention and erosion control. Rates vary with the product. Straw and an asphalt binder can be used. Clean straw must be used to avoid contamination by forage grasses.

Fall is the preferred time to seed. Rainfall, temperature and other factors cause this to be the best time. Seeding at other times will require backup irrigation, greater weed competition, and higher seedling mortality. Sod may be a better choice for late spring and early summer lawn installation.

### Sod Transplant Rooting Characteristics of Several Kentucky Bluegrass Cultivars (Transplant Rooting Measurements Were Made 21 Days After Sod Placement)

<table>
<thead>
<tr>
<th>High</th>
<th>Intermediate</th>
<th>Low</th>
</tr>
</thead>
<tbody>
<tr>
<td>Merion</td>
<td>Baron</td>
<td>S. Dakota</td>
</tr>
<tr>
<td>Touchdown</td>
<td>Majestic</td>
<td>Newport</td>
</tr>
<tr>
<td>Adelphi</td>
<td>Fyking</td>
<td>Cougar</td>
</tr>
<tr>
<td>Vicia</td>
<td>Park</td>
<td>Delta</td>
</tr>
<tr>
<td>Glade</td>
<td>A-34</td>
<td>Galaxy</td>
</tr>
</tbody>
</table>

(Study conducted at the University of Nebraska, R.C. Shearman)
HOSE WITHOUT A REEL IS A DRAG

There’s No Messing Around With Hannay Reels

Eliminate hose mess with Hannay Reels!
• Pull out smooth & easy. Wind up straight & fast.
• Store hose neatly, ready to go when you are.
• Less wear and tear on you and the hose.
• Fertilizers. Pesticides. Herbicides. Whatever you spray, rely on Hannay!

Free fact-packed Reel Guide! Ask for your copy today.

Buy Hannay Reels and Wind Up With The Best

Sod Installation

Sod, the instant lawn, is the fastest method of lawn establishment available. It is also the most expensive.

Soil preparation is the same as for seed. Sod must be handled quickly and kept moist. The best sod for a site is one that was grown on soil of the same texture. The soil should be sprayed lightly just prior to laying the sod. After the sod is down and trimmed, it should be rolled and perhaps topdressed at edges and joints if necessary. The sod should be soaked thoroughly two or three times per week for at least four weeks. Some turfgrass sods knit more rapidly than others. These sods should be specified for areas where use is anticipated soon after installation, such as athletic fields or greens.

Sod should be irrigated regularly throughout its first season. It has received high levels of maintenance at the sod farm and has adjusted to frequent water and feeding. Sod producers select aggressive cultivars for fast knitting and growth. Like any fine lawn, sod represents a commitment to maintenance and must receive it to remain healthy. Sod in shady areas will take longer to knit than in full sun. Sod for shaded areas should contain shade tolerant cultivars.

Sod can be staked to slopes where erosion and seeding failure are more likely. Ditches designed to carry infrequent runoff may also be sodded.

Vegetative Planting

Vegetative plantings can produce a mature turf stand more rapidly than seeding. They too cost more than seeding, but less than sodding.

Verticutting (above) is an essential step in lawn renovation to obtain satisfactory seed/soil contact and to avoid seed germination in the thatch layer.

Aerification (bottom) improves drainage and air penetration and reduces the chance of compaction by traffic. One extra step is to sand topdress into holes.
TWO GREAT GAMES
ONE GREAT GRASS

Super Bowl XIV and the Rose Bowl classic were the great games. The turf? That was Derby Turf-type perennial ryegrass.

Derby was selected by George Toma, the man responsible for the Super Bowl XIV turf and Gus Huntly, turf manager for the Rose Bowl game, because of the special requirements for these special games.

Toma and Huntly wanted a fast-germinating, dark-green, handsome grass as well as one tough enough to take a pounding and still look great for the television cameras.

And Derby did it all. Of course, it will do more. It mows beautifully and thrives when cut at 1½ inches or at 3/16 inch on golf greens. In Southern areas it’s a top choice for winter overseeding of golf greens.

Derby is also a great mixer, combining with the fine fescues and bluegrasses to form an outstanding turf.

HERE’S WHAT DERBY WILL DO

• Persists in heavy, compacted, poorly drained areas where traffic is not intense
• Tolerates a wide range of soil types from heavy clay to sandy
• Retains its deep green color during chilly Southern winters
• Germinates in less than a week under ideal conditions
• Thrives when cut to 3/16, 1 inch or 1½ inches
• Mixes nicely with fine fescues and bluegrass

A Product of INTERNATIONAL SEEDS, INC.

P.O. Box 168, Halsey, Oregon 97348
Telephone: (503) 369-2251 • TWX 510/590-0765

Write 168 on reader service card
Labor needs are greater than seeding.

Once again, site preparation is the same as for seeding. Sprigs are planted in 8 to 12 inch rows in three-inch deep slits. Two to four bushels of sprigs are needed for each 1,000 square feet. Stolonizing involves broadcasting stolon segments onto the prepared seedbed. The stolons are then topdressed with fine soil of the same origin as the seedbed. Broadcast planting takes five to ten bushels of stolons per 1,000 square feet.

Plugging is a third alternative. Like sod, best results are obtained if the soil in the plugs is similar to the seedbed. Rows 12 to 16 inches apart are planted.

Shade, lack of moisture, and inadequate fertilization will slow the spread of the vegetative material. Warm-season grasses have the advantage of remaining aggressive in comparison to many weeds during warm months. Vegetative plantings are monostands. Stolons of other grasses can infest a planting, especially in broadcast planting. Nurseries are certified by many states to assure that vegetative material is only of the desired type for the particular job.

Renovation

Renovation is becoming more popular as a method to improve existing turf stands. Roundup has shortened the process with its near lack of residual activity.

It is done either by seedling or sprigging into existing turf stands that have been treated. Soil improvement is limited to aeration and topdressing if done. Thatch should be removed with a thatcher or verticutter. Cores should be broken up and a starter fertilizer applied. Seed is applied and brushed or rolled to assure surface contact. If preferred, the seed could be lightly topdressed.

The area should be watered just as a normal seedbed following seeding. The existing vegetation provides some protection against erosion and light from reaching the seedlings. Shaded areas may not respond to renovation. Soil is not appreciably better than before renovation either. It is a partial solution and may not reduce maintenance levels or correct basic soil deficiencies.

Overseeding

Overseeding for winter transition or turf improvement is perhaps the fastest growing use of turfgrass seed. It is renovation without killing the existing turfgrass.

Cool-season turfgrasses are overseeded into warm season grasses as they go dormant in the winter. Turf texture and color are retained throughout the winter months. Upon return of warm weather, the warm season grasses come out of dormancy and dominate the cool season turfgrass.

Overseeding with similar turfgrasses is also feasible. Thin stands of Kentucky bluegrass can be verticut, closely mowed, and seeded with improved varieties. This is a less expensive way of adding disease or shade tolerant cultivars to older bluegrass stands.

High rates of seed are used in overseeding. Mortality is higher for seedlings in overseeding. Seeding rates double that for regular seed establishment are common. Seed can be lightly topdressed. Traffic should be restricted in the area if possible. In some cases fungicides are applied soon after overseeding to improve germination and survival.
When Charles Craig decided to renovate 35 acres of this college campus with Roundup® herbicide in 1977, he knew that if it didn’t work, he’d probably have to “hide under a rock.”

But, fortunately, Charles didn’t have to go into hiding because just 7 days after he applied Roundup he was able to reseed right into the dying grasses.

“Yes, I put my career on the line, but I felt all along that Roundup was going to work,” Charles says. “There was no doubt in my mind.”

As horticulturist for Mercer County Community College in Trenton, New Jersey, Charles Craig depended on Roundup for the broad spectrum control he needed for tough grasses like quackgrass, orchardgrass, tall fescue and others. And since Roundup has no residual soil activity, he was able to reseed in a matter of days.

“Seed germination was terrific, especially with the weather we had,” Charles told us. “Everyone always says it looks nice.”

Charles still uses Roundup for touch up jobs around cracks in the pavement, parking lots, buildings, tree bases and flower beds. Taking precautions against spray drift, Charles has no fear of harming surrounding vegetation with Roundup.

Charles Craig is convinced that Roundup works, and he has 35 acres of beautiful turf to prove it.

To see how it can work for you, reach for Roundup where you buy chemicals.

For literature, call 1-800-621-5800, or in Illinois, 1-800-972-5858.

Charles Craig put his career on the line to use Roundup herbicide. And he won.

There’s never been a herbicide like this before.
"Regal rye, I presume?"

The best-looking grass in Kansas City can be found, of all places, at the Harry S. Truman Sports Complex. Regal perennial ryegrass can be found here—in the landscaping around Arrowhead Stadium, as well as in the football practice field. Overseeding the Baron and Ram I bluegrass in this field with a team of perennial ryegrasses, including Regal, produces a playing surface that withstands the almost daily wear and tear by tough Kansas City Chiefs. The result, according to George Toma, Director of Field and Landscaping Operations, is a truly tough yet beautiful turf.

Don't you have a place for Regal turf-type ryegrass?

© North American Plant Breeders, Mission, KS 66201

Write 160 on reader service card
unionization.
Rich Brolick, Zelenka Evergreen Nursery, Inc., Grand Haven, MI, spoke about problems with migrant labor. His company has spent over a million dollars in migrant facilities. "The key to the whole migrant program is the housing," said Brolick.

In addition to the sessions, John B. Wight, Jr., president and chairman of the board of Wight Nurseries, Inc., Cairo, GA, was elected president of AAN, replacing Hugh Steavenson, president of Forrest Keeling Nursery, Elsberry, MO.

The AAN inducted John J. Pinnery, Ottawa, KS, into the Nurserymen's Hall of Fame. It also presented two national awards to Harold Davidson, professor of horticulture at Michigan State University, for his nursery research contributions and effective teaching in horticulture.

To commemorate the convention, the AAN held a tree planting ceremony at the Nelson Gallery of Art and Atkins Museum in Kansas City.

JAMES W. ADAMS TO THE NEW POSITION OF SENIOR VICE PRESIDENT, INTERNATIONAL OPERATIONS, JOINING TORO'S SIX-MEMBER EXECUTIVE MANAGEMENT COMMITTEE.

Since starting with the company in 1974, Adams has been a group vice president of Toro's irrigation operations.

COMPANY

INTERNATIONAL HARVESTER CHANGES CO. NAME

International Harvester, Payline Group, has altered its name to Construction Equipment Group.

The new name is expected to improve worldwide recognition of the International Harvester Co. products for which this group has manufacturing and marketing responsibilities.

PROMOTIONS

Toro promotes Adams to new position

The Toro Company recently promoted James W. Adams to the new position of senior vice president, International Operations, joining Toro's six-member executive management committee.

LAWN CARE

NEW OFFICERS ELECTED FOR LAWN INSTITUTE

Norman Rothwell of N.M. Rothwell Seeds, Ontario, Canada, has been recently elected president of the Lawn Institute, and 10 new members have been elected to the Board of Trustees.

Other members serving with Rothwell will be Robert Peterson of E.F. Burlingham & Sons as vice president, and Robert Russell of J & L Adikes, Inc. as secretary-treasurer.

The Lawn Institute, sponsored by lawnsen breeders and growers, is a nationally recognized source of information concerning lawnglasses.

75 Gaylord • Elk Grove Vil., IL 60007
312-640-6644
Toll Free: 800-323-0618 • (In Illinois: 800-942-1113)

A remarkable innovation in FORK LIFTS

The SPYDER

...versatile, flexible, maneuverable.

PORTABILITY: Can load itself on rear of truck or trailer bed or attach to custom designed trailer for towing behind car or pick up truck.
WEIGHT: Approximately 2,700 pounds.
CAPACITY: Carry over 3,500 lbs. Comparable to 12,000 lb. Fork lift.
PERFORMANCE: Can outperform, outmaneuver, and out maintain any other fork lift.
OPERATION: Operates in rough terrain and muddy conditions.
STRENGTH: Exceptional strength comes from total hydraulic system and ability to balance load.
Economically Priced
Low Maintenance

SPYDER SALES INC.
12838 Westheimer Rd.
Houston, TX 77077
713-496-4730
Toll Free: 800-231-5916
(In Texas: 800-392-2459)

Write 152 on reader service card
Climb on something stronger

**Arbor-Plex™**

**Arbor-Plex™ climbing, bullrope**

Arbor-Plex™ 12-strand...designed specifically for climbing and bull rope applications. Arbor-Plex™ has been extensively tested in the field and has proven itself with these advantages:

- Twice the strength of manila
- Duron* II polyester for durability
- Firm "nubby" surface for good grip
- Lightweight, throws well
- Good knot holding
- Torque free, non rotating
- Green stripe for easy identification
- Resists chemicals and UV, won't mildew

Arbor-Plex™ is available through Samson Distributors. Send on company letterhead for descriptive literature and a Free six foot sample of 1/2" climbing rope.

Samson, Dept. AP, 99 High Street, Boston, MA 02110

Write 103 on reader service card

---

**VEGETATION MANAGEMENT**

**By Roger Funk, Ph.D., Davey Tree Expert Co., Kent, Ohio**

**Q:** What is the best chemical to control cottony maple scale on silver maples?

**A:** We use primarily a combination of malathion and and sevin during the crawler stage (July in the Northeast). Field studies have shown similar results with Diazinon.

**Q:** I read where dorman oil will remove the blue color from Colorado blue spruce. Is the loss of color permanent?

**A:** It has been our experience that the blue color, which is a waxy exudate, normally returns within a month.

**Q:** How do you treat the soil to prevent root graft transmission of Dutch elm disease?

**A:** According to the Vapam label from Stauffer Chemical Co., dilute one part Vapam to three parts water. Drill holes approximately 3/4 to 1 inch in diameter, 15 inches deep, and 6 to 9 inches apart. Fill each hole with diluted Vapam to within 2 inches of the soil surface. Make a line of treatment sufficiently long to kill all roots of the adjacent trees that are likely to be root-grafted. Apply the chemical slowly and carefully to avoid overflowing the drilled holes and tamp each hole until closed. Allow at least two weeks after treatment before removing the diseased trees.

**Q:** I recently came across the term $LC_{50}$ and thought it was a misprint for $LD_{50}$, but I have since seen it again in print. I have not been able to find anyone who knows what it means (if anything). Can you help?

**A:** $LC_{50}$ is the median lethal concentration rather than the median lethal dose ($LD_{50}$). It is often used to measure the toxicity of a chemical present in air or water.

**Q:** Do fungicides protect turfgrass growth that occurs after the application?

**A:** Contact fungicides do not. Systemic fungicides are absorbed by the roots and translocated throughout the plant system. Newly emerging leaves may contain sufficient concentrations for protection against certain infectious organisms.

**Q:** How long do you have to wait to reseed a lawn after applying broadleaf herbicides?

**A:** In general, a waiting period of three to six weeks is recommended before reseeding since these herbicides can cause seedling injury. Recent research has shown that when using a slicer-seeder herbicides could be applied at or prior to seeding with no significant reduction in turf stand.
It's obvious... you can depend on a National

It's easy to check our best features. We don't cover 'em with a shiny shroud. **What you see is what you get**...a completely functional and easily maintainable machine built with a minimum number of components. National's 84-inch Triplex offers the same superb performance on hillsides or level ground. Three, power driven, free-floating reels follow ground contour and cut without skip or scalp. Reels adjust down to fixed bed bars providing for more rigid and longer lasting mowing units. Bed knives have turned up lips for extra wear...a feature we introduced as early as 1925. National's no-nonsense design makes normal service faster than any mower on today's market.

Check out the economies of National's ugly beauties. We've been adding nothing but quality since 1919...it's obvious!

---

Model 84 Triplex

Deliberately designed to provide its own power source which allows unit to be pulled by almost any size tractor with or without PTO. Five, free-floating, powered reels cut an 11½ foot swath. Wings fold to 68".

68" Triplex

Low center of gravity and wide track provide great maneuverability. Mows a 68-inch swath at speeds up to 4 mph...that's half an acre in 15 minutes. Wings fold to 37½".

---

NATIONAL MOWER COMPANY
660 Raymond Avenue • St. Paul, Minnesota 55114
612/646-4079

See us at GCSAA Show, Booths 2330, 2332, 2429, 2431 Area C

Write 174 on reader service card
Junipers Thrive in Various Soils, Suit Many Planting Designs

By Douglas Chapman, Horticulturist, Dow Gardens, Midland, MI

If used correctly, cultivars of juniper (Juniperus chinensis, communis, horizontalis, and sabina) and Eastern Redcedar (Juniperus virginiana) can add variety and low maintenance to the landscape while being tolerant of urban conditions. Their ultimate height varies from 6 inches (native Juniperus horizontalis) to 40 feet (Eastern Redcedar). Junipers thrive in conditions varying from swamp-water sand (Eastern Redcedar) to well-drained rocky sites. They will grow in the shade of a swamp or full sun of foundation plantings.

Juniper thrives in soil conditions from well-drained sand to heavy, yet well-drained clay. The pH can vary from 5.0 to 7.0 with little problem. Junipers can be used in mass plantings, hedges, shelter belts, foundation plantings, and rock gardens, in fact, almost any application. They thrive in full sun while only tolerating partial shade, in fact, becoming open and leggy in shady conditions.

The insects and diseases are many, including cedar apple rust, twig blight (Phomopsis juniperovora), web worm, scale, mites, and bagworm (In Illinois, Indiana, and Missouri), but only a few are catastrophic. The catastrophic pests are twig blight (Phomopsis juniperovora), scale and mites.

There is a tremendous varietal variation as to Phomopsis (twig blight) resistance, not only between cultivars but also geographic locations in the landscape. This tremendous variation of susceptibility has been surveyed by many of the land grant colleges. When designing a planting, checking with your local Cooperative Extension Service for an approved list is paramount. A few of the most resistant juniper varieties, as reported by Laemlen, Michigan State University, included J. chinensis 'Ames,' 'Armstrongii,' 'Fairview,' 'Hetzi,' 'Keteleeri,' 'Mountbatten,' 'Pfitzeriana,' 'Pfitzeriana Aurea,' 'Pfitzeriana Compacta, sargentii, procumbens, and to a slight extent, procumbens 'Nana'; J. horizontalis Douglasii,' 'Emerald Spreader,' and 'Wiltonii'; and J. sabina 'Arcadia,' 'Broadmoor,' and 'Von Ehrn.' Moderate success has been achieved when spraying several times (two minimum) with Benlate and a wetting agent. Use of chemicals during a cool, wet spring, when the disease is rampant, has met with varying results.

Scale and mites can be severe problems. Many junipers that stop growing are suffering from a severe mite infestation which occurs during the heat of summer. Control is relatively easy with a miticide or ovicide when a slight yellowing or bronzing of the foliage becomes apparent, symptomatic of a heavy infestation.

The only effective way to discuss junipers is by cultivar. The over 170 cultivars available in the trade, as reported by Wyman, make this an exciting yet confused group. Further, each year additional varieties are being selected and introduced. Therefore, one should be continually trying new cultivars to add resistance and variety in the landscape. The following discussion of cultivars is designed to assist landscape architects and grounds managers make effective decisions, reducing maintenance while improving the quality of the landscape.

Chinese Juniper (J. chinensis) is an exciting juniper when considering the many cultivars. They range in height from 12 inches to 15 feet, prefer growing in full sun, and display a broad range of exciting greens in landscapes.

'Ames' has a steel blue foliage, turning somewhat paler green with maturity. Initially, it was introduced as a dwarf, but we find it is wide and spreading, reaching 3 to 4 feet in height.

'Armstrongii' is a sort of Pfitzer Juniper with a softer blue-green foliage, taking on the habit of Compact Pfitzer, rarely reaching over 3/4 feet in height while being quite horizontal.

'Blaauw' is a semi-upright vase-shaped shrub with a rich blue-green foliage, reaching about 4 feet in height and width, making it an excellent hedge plant; formally or informally pruned.

'Fairview' is a narrow, pyramidal, vigorous growing plant with silverberry-like cones developing during late summer and early fall. This cultivar shows resistance to twig blight and mites.

'Hetzii' is a large, upright growing shrub, reaching 15 feet in height and width at maturity. Its foliage is dense, being lightly bluish-green.

'Iowa' is reported in some areas to have slight resistance to twig blight and is a somewhat upright growing shrub, reaching 10 feet in height. It is particularly effective in formal areas where that blue-green coarse foliage can add variety.

'Keteleeri' is a light to medium green foliage which is somewhat grayish-green early in the season, becoming a light green later. The habit of growth is broadly pyramidal with a good strong central leader. This plant is extremely effective in mass plantings or as informal hedges.

'Mint Julep' is an introduction of Monrovia Nursery. Its habit is somewhat upright, spreading with arching branches while not being nearly as horizontal as Pfitzer Juniper with a brilliant light green foliage. It is a uniquely shaped vigorous addition to the informal landscape.

'Mountbatten' is a 20-foot, dense, somewhat compact, narrow pyramidal-shaped tree. The foliage is a steel blue-green, reaching 18 to 20 feet in height.

'Pfitzeriana' is probably the most widely planted of the juniper types. Its broad spreading form, which reaches 5 to 6 feet in height and 10 feet in width, gives almost a fountain-like appearance. It is effective in mass plantings or as specimen shrubs. The light green foliage and habit are characteristic.

'Pfitzeriana Compacta' is a dwarf or compact Pfitzer with gray-green foliage. It is slower growing and well suited to foundation planting. One must mulch late plantings heavily as winter injury can be a problem when planted in September and October.

Sargentii, a low-spreader juniper, 18 to 24 inches in height, with a 6 to 8-foot spread, is quite regular, giving a formal appearance to the area. It can be effective in mass plantings or as a ground cover with exciting blue-green foliage. Sargent Juniper shows excellent resistance to twig blight.

Procumens (Japanese Garden Juniper), now listed as *J. chinensis* procumbens, is one of the premier juniper types. It reaches 12 to 28 inches in height with a 5 to 10-foot spread. Its light green foliage is exciting, allowing it to adapt well as a ground cover or specimen plant. It is extremely effective in beds or mass plantings, being contained easily with light pruning. In Michigan, *Phomopsis* (twig blight) rarely develops, but mites can become a problem.

Procumbens 'Nana' (Dwarf Japanese Garden Juniper) is very slow growing and considerably more compact. It may be used as a ground cover in rock gardens or in open areas. In Michigan and Ohio twig blight is an extreme problem. This plant has a place in the landscape, but it is so slow growing that any slight damage can often result in a plant that decreases in stature. It should be used sparingly in Michigan, but Dirr has reported few problems in Illinois. Again, check your local Cooperative Extension Service.

Common Juniper (*J. communis*) is native to a broad area of the United States. It should be noted though that provenance is important. Plants doing extremely well in New England will not always flourish in Pennsylvania. The habit of this small tree is somewhat ascending, reaching 6 to 12 feet in height. Wyman reported Common Juniper reaching 36 feet in the wild. The plant is sprawling with a fine needle-like foliage which is gray to blue-green in the summer, taking on a somewhat yellowish cast during the fall months. The cultivars of this group are well discussed in literature, but one should visit local nurserymen or the Cooperative Extension Service to obtain information as to local adaption.

Creeping Juniper (*J. horizontalis*) is an exciting native ground cover plant. Although there are many varieties in this group which tolerate hot, dry, sunny locations, it is exciting when used in rock gardens, foundation plantings, or mass plantings for erosion control. Many of the cultivars are extremely susceptible to twig blight; therefore, I shall only discuss the few which are showing good or almost complete resistance.

'Douglasii' is a very horizontal, rapid growing shrub. It reaches 12 to 18 inches in height and 6 to 8 feet in width. The blue-green foliage of summer often turns somewhat purplish throughout the winter months, adding additional color to the landscape.

'Emerald Spreader' is a low growing form, rarely over 6 to 8 inches in height with a light open habit. Its brilliant mint-green foliage is a great addition to the landscape, held year round.

'Wiltoni' or 'Blue Rug' is a very horizontal form, reaching 6 to 8 inches in height with a spread of 6 to 8 feet. Once established, this plant can grow quite rapidly.

Savin Juniper (*J. sabina*) and its cultivar are an exciting addition to the landscape. They range in height from 1 to 6 feet with 5 to 10-foot spread. The species has dark green foliage in the summer, becoming a dull green during the winter months. It does extremely well on our high pH soils.

'Arcadia' has a similar habit of growth as var. *tamariscifolia* while being more prostrate, growing one foot in height and 3½ feet in width. The foliage is predominantly grass green. 'Arcadia' shows good resistance to twig blight.

'Broadmoor,' a dwarf low-spreading shrub which tends to build up from the center with age, is unique in habit and color. The color, early in the season, is a brilliant mintgreen, becoming a soft gray-green during late summer, fall, and winter. 'Broadmoor' rarely goes over 18 inches in height while being five to 10 feet across.

'Von Ehron' is a vase-shaped shrub, 6 feet by 10 feet in the landscape, while reaching 15 feet by 45 feet, according to Wyman. The foliage is a light green. 'Von Ehron' has few problems while being extremely resistant to juniper twig blight.

**Eastern Redcedar** (*J. virginiana*), a native with an extensive range covering most of the area east of the Mississippi, thrives in well-drained, gravelly, high-water table soils but will tolerate almost any diverse soil condition. When young, it is fairly tolerant of shade but thrives in sunny, open areas. It is an excellent specimen or mass planting tree useful in hedges, windbreaks, or native planting. It reaches 40 to 50 feet with a 10 to 20-foot spread. Resistance to twig blight should be paramount in selection of cultivars. Some of the tree forms which show good twig blight resistance include 'Burkii,' 'Cupressifolia,' 'Glauc,' and 'Hillii.'

Junipers and Eastern Redcedar are extremely tolerant of many urban conditions. They thrive in dry, gravelly soils needing little care if the correct plant is selected. That correct plant is one that will not outgrow its area or be attacked by mites or juniper twig blight. Juniper adds another dimension to our landscape with a narrow-leaf evergreen which thrives under severe winter or summer conditions. It is highly competitive and, therefore, should not be used around every tree, but only trees which are deep rooted and effective competitors, e.g., Bur Oak.
USED EQUIPMENT


FOR SALE: 78 inch Big John tree mower serial 32 in good condition, original owner. Trees, Inc. 517 627-9155.

BRUSH CHIPPERS, used Bean sprayers, Model 10 Vermeer stumpers, Hydro-Ax and bucket trucks. Lease or for sale. Large inventory available. Call or write P. C. Gould Sales Company, Plains Road, Essex, Conn. 06426. 203 767-1636.

LATE 1974 SKYWORKER, 52’, 2 hydraulic limb lopper chain saws, one lopper, mounted on 1974 International Loadstar 1800 1/2 ton; 14 cubic yard hydraulic dump box under aerial boom (special order from Skyeworker); built in tool boxes; Micro-Lever Lock all-wheel brake, 33,200 miles with 1974 Fitchburg chipper, 12”, 749 hours, excellent condition, mechanical and appearance. Call 515 265-4485 day, 515 265-3375 night.


MODEL 500 HYDRO-AX, S/N 265 with D-150 Nicolas mulcher. Excellent condition. $55,000.00. Osborne Tree Service, Mentor, Ohio 44060. 216 253-9109.

MYERS INDUSTRIAL SPRAYER, mounted on 1972 Chevrolet truck, 1,000 gallon tank with power agitation. Excellent condition, $19,500.00. Lakewood Country Club, 216 835-4398.

SPRAYER, 1979 Bean Turf model 1010T, 150 gallons, 500 psi, 10 GPM, flotation tires, like new, $700.00 below cost. 712 623-9372, Rand Wilson, Box 56, Red Oak, IA 51566.

ROYER CHIPPER, used one year, $3,450.00. Timber Wolf Tree Service. 717 367-1916.

FOR SALE Jacobsen F20 turf tractor, 9 gpm reel mower, 5 blade Blitzer mowers, Diesel engine, 1350 hours, power steering, 850 hours, good condition. 317 842-1813.

77 BOWIE VICTOR 800 gallon hydroseeder, hose and attachments, Wisconsin engine, tandem mounted, excellent condition! $7000. 612 743-2255, Minnesota.

REINCO HYDROSEEDER with or without trailer, 1000 gallon unit, excellent condition. $8500. 317 873-5231 or 317 873-5937.


FOR SALE: Three spray trucks, 1976 and 1977 Chevy. C-60’s, completely equipped with 1,200 gallon steel tank, mechanical agitation, Bean 20-20 pump, Hannay electric reel, hose, etc. Complete units, excellent condition, ready for immediate use. Will sell separate or special combined price. Phone 502 897-5201 day or 502 896-8078 nights.

SEEDS


LAWN SEED. Wholesale. Full line of top quality grasses. Improved bluegrass varieties, fine fescues and fine bladed ryegrasses. We specialize in custom mixing. Oliger Seed Company, 2705 Wingate Avenue, Akron, Ohio 44314. Call collect 216 753-2259.

JOJOBA SEED PACKETS $1.50. Jojoba Oil $1.75. KSA Jojoba, 19025 Parthenia, Northridge, CA 91324. Phone 818 990-7272.

HELP WANTED

ADVERTISING SALES POSITION AVAILABLE with a growing specialty agri. magazine, Chicago territory. Requires individual with 1 to 2 years chemical and equipment sales experience in the agri. or specialty agri. market at the distributors level. Ad. space sales experience desirable but not required. Salary plus commission, all expenses, a strong benefit program and plenty of room to advance. Reply to Box 243, Weeds, Trees & Turf, Box 6951, Cleveland, Ohio 44101.

JOB OPENING IN HORTICULTURE.

Position: Working supervisor and gardener for Kentucky estate. Requirements: Proficiency in horticulture, landscape, greenhouse and garden management. Knowledge of aboriculture and landscape operations highly desirable. References required. For terms and personal resume please contact Mrs. Dillon, P.O. Box 61334, Houston, 77208.

SUPERVISOR: Bell Telephone Laboratories, Holmdel, N.J., has an immediate opening for a grounds maintenance supervisor. This position calls for professional planning and direction of landscape, grounds maintenance and snow removal programs. Please send resume to J.J. Lenox, Bell Telephone Laboratories, Room 3C-340, 600 Mountain Avenue, Murray Hill, New Jersey 07922.

LANDSCAPE SUPERINTENDENT — Houston's fastest growing landscape contractor is offering a position of unlimited potential. Excellent salary, year round benefits, individual with 1 to 2 years experience and turf products background required. Duties will concentrate on establishing and maintaining national distributor network for grounds maintenance machinery manufacturer. Reply to Box 250, Weeds, Trees & Turf, Box 6851, Cleveland, Ohio 44101.

FOR SALE

VAIL, CO. Year-round nursery, snow plow business, located on 1 acre parcel with two commercial buildings, rental income. Includes 3 loaders, 2 dump trucks, 5 pick-up trucks with snow plows. 8 year est. business. 303 478-3433.


LIQUID FERTILIZING and tree removal company established 1974 with major growth each year. Year round business located in the western suburbs of Chicago. Will divide. 312 584-5753.

ESTABLISHED LAWN & TURF irrigation company in Michigan, machinery, tools, inventory, vehicles, misc. Purchaser shall receive client list and any open contracts at time of sale. Company is very strong in
Cut Overseeding Rates Up To 50% with a Great Poa trivialis

SABRE

There's no other turf grass quite like it.

The first U.S. variety of Poa trivialis granted a Plant Variety Protection Act Certificate, Sabre is a dark green, fine-bladed turf grass that creates an absolutely superb green when overseeded on dormant turf such as Bermuda.

A rapid germinating variety, Sabre is a perfect overseeding companion for the turf-type ryegrasses and fine fescues. In an overseeding mixture Sabre has the additional advantage of reducing the seeding rate by as much as 50%.

Normal overseeding rate for either the turf-type ryegrasses or fine fescues is 35-40 lbs. per 1,000 square feet.

However, the seeding rate of either a ryegrass or fine fescue overseeding mixture which includes 20% Sabre (by weight) can be reduced to 18 lbs. per 1,000 square feet.

An extremely shade tolerant grass, Sabre is an ideal component in an overseeding mixture because it will disappear very rapidly when the hot weather arrives, thus clearing the way for the emerging Bermuda grass to come on.

You can also count on Sabre to be free of Poa annua.

SABRE—add it to your overseeding mixture and you’ll be amazed at the beauty you have created. (Sabre • P.V.P. No. 7700104)

INTERNATIONAL SEEDS, INC.
P.O. Box 168, Halsey, Oregon 97348
Telephone (503) 369-2251 • TWX 510/590-0765
service and installation. Terms available. Reply to Box 248, Weeds, Trees and Turf, Box 6951, Cleveland, Ohio 44101.

**BUSINESS OPPORTUNITIES**


**WANT TO BUY OR SELL a golf course?** Exclusively golf course transaction and appraisals. Ask for our catalog. McKay Golf & Country Club Properties, 15533 N. East Street, Lansing, Michigan 48906. Phone 517 484-7726.

**ESTABLISHED LAWN & TURF irrigation company** in Michigan, machinery, tools, inventory, vehicles, misc. Purchaser shall receive client list and any open contracts at time of sale. Company is very strong in service and installation. Terms available. Reply to Box 249, Weeds, Trees and Turf, Box 6951, Cleveland, Ohio 44101.

**MISCELLANEOUS**

**START YOUR LANDSCAPING career now!** Write: School of Landscape Design and Sales. Lake City Community College, Lake City, Florida 32055. Fully accredited and V.A. approved.

**MILKY SPORE BACTERIA** — For control of Japanese Beetles and certain other white grubs. Protect your turf . . . apply in fall, for fall and spring protection. Effective up to 20 years. USDA developed. Lb. per 4,000 sq. ft. Catalog 1 lb. $89.50; 5 lb. $99.00; 25 lb. $299.85. Add 5% for prepaid shipping. Mellinger's, 2304C Range, North Lima, Ohio 44452.

**TREE PROBLEMS** — Botanical, legal and appraisals. For directory of members of American Society Consulting Arborists in U.S. and Canada, write: Executive Director ASCA, 12 Lakeview Avenue, Milltown, N.J. 08850. 201 821-8948.

**GARDEN TIPS** the monthly newsletter for you to send to your customers. Image building. Profit making. Better customer relations. It's yours, because your business name is on it. Your customer buys more, and respects you because of your thoughtfulness and knowledge. A positive low cost way to build your business and keep your customers. Write to Garden Tips, P.O. Box 117, Garden City, New York 11530 or call 516 483-0100.

**GREEN PRO EXECUTIVE NEWSLETTER** . . . designed for you if you are serious about your career in the Greens Industry . . . with an eye on success, professionalism and profits . . . and that's the bottom line! A weekly newsletter, a store house of immediately usable information delivered to your mailbox each week. Advice, ideas, customer relations . . . many vital subjects designed for those in our industry who want to get ahead . . . stay there! Write to Green Pro Executive Newsletter, 380 S. Franklin St., Hempstead, New York 11550 or call 516 538-6444 for information and a free copy.

---

"We haven't had a minute's down-time since our TORCO sprayer was put in operation"

— Bob Birkholz

Chem Green, a division of Gloria Landscaping

Durability means long life with low maintenance costs, and TORCO sprayers are specifically engineered for the greatest durability records in the lawn care industry. Our low H.P. systems not only save energy, they save you money at the gas pump — and that's just one more reason why customers like Bob Birkholz choose TORCO.

TORCO means tough!
TORCO Equipment Company • 207 Eiler Ave. • Louisville, Kentucky • 40214
(502) 366-1415

Write 141 on reader service card

---

NEXT MONTH IN WTT

We will resume our regular departments, many of which had to be cut this month for our special Buyer's Guide issue. Look for part 4 of the Turf Management Series on "turf care and maintenance techniques."
A low-cost, practical way to plant grass so it will stay and grow.

Con-Serv fiber mulch is a specially recycled material for hydroseeding, so grass can take root firmly in a weed-free environment. It's an instant anchor blanket which permits gradual, healthy absorption and retention of rain for maximum growing conditions without erosion.

Green Thermal Blanket
An attractive, water-soluble green blanket can be sprayed on in one application. It acts as a thermal barrier on the ground to foster germination, and then gradually decomposes as the grass naturally roots into the soil.
DON'T CUT OUT QUALITY.
DO IT RIGHT, WITH STANLEY.
Quality, by our standard, is something which goes a lot further than making tools. To Stanley, it means: a full line of tree trimmers for every job; the best warranty in the business; complete parts backup; and distributors to help you anywhere in the country. It's also the efficiency, safety and dependability of hydraulic power. We don't trim on anything so that you're able to do your trimming faster. Stanley Hydraulic Tools: 3810 S.E. Naef Road, Milwaukie, Oregon 97222. Phone (503) 659-5660. Telex 360771. Write or call.

STANLEY
Write 127 on reader service card

Advertising Sales Offices

ATLANTA
Dick Gore,
National Sales Manager
3091 Maple Drive
Maple Center One Building
Atlanta, GA 30305
404+233-1817.

SEATTLE
Robert A. Mierow
1333 N.W. Norcross
Seattle, WA 98177
206+363-2864

NEW YORK
Brian Harris
757 Third Ave.,
New York, NY 10017
212+421-1350

CHICAGO
Jeff Dreazen
333 N. Michigan Ave.
Chicago, IL 60611.
312+236-9425

Materials and orders for display advertising or classified advertising should be sent to Chris Simco, Harvest Publishing Co., 9800 Detroit Ave., Cleveland, OH 44102. Deadlines are generally the first week of the month prior to publication.
It has two seats and two headlights instead of one. It's easier to service, has undentable fenders and a diamond steel rear bumper.

You can buy it with a full line-up of accessories for aerating, seeding and spreading, top dressing or spraying.

One more thing. It sells for about the same price as the leading competitor. We don't mean to unload on them, but we just had to say some of these things before you went ahead and bought their machine before trying our GT-7.

For a demonstration on your course, just call your E-Z-GO Branch Office or Distributor. They're in the Yellow Pages. Or call us at (612) 542-0516.
At last...A fescue that's green enough to match bluegrass, Jamestown Chewings Fescue

Researchers have long looked for a fine-leafed fescue that has the color and adaptability of modern bluegrasses and that will look well in a seed mixture. Jamestown, a low-growing new variety of chewings fescue, developed at the University of Rhode Island, is the answer for nearly every turf condition required. Jamestown has good disease resistance, shade tolerance, the darkest green color of any fescue on the market and wide adaptation. Jamestown has been thoroughly researched by universities and independent research groups throughout the United States and Canada. But, most importantly, the low growth and brilliant color are the outstanding virtues landscapers, contractors, sodmen and golf course superintendents count on. Jamestown can be used for practically any turf condition.

GENERAL LANDSCAPE...
For home lawn use, institutional, parks...university studies from Winnipeg, Canada to Maryland have consistently rated Jamestown number one in overall quality for the past five years. Jamestown broadens the adaptation of bluegrasses because of shade tolerance and lower fertility requirements.

SOD FARMS...
Jamestown is ideally compatible in persistence and color to the new Kentucky Bluegrasses such as Baron and Majestic. It's natural low and dense growth combined with its deep rich color makes Jamestown the number one fescue for use in the sod industry.

GOLF COURSES...
In the temperate climates Jamestown should be used for seed mixtures on tees, roughs and fairways. While in the Bermuda belt Jamestown is the best fine leafed fescue for fall overseeding greens. A Clemson University study showed that Jamestown is outstanding at a cutting height as low as 1/8 inch.

Remember...Jamestown is particularly useful where turf conditions are less than perfect. It does very well in non-irrigated and somewhat infertile soils where the turf may be subject to adverse conditions on low maintenance budgets.

Worldwide Producers and Marketing Agent
Lofts Pedigreed Seed, Inc.
Bound Brook, N.J. 08805 / (201) 356-8700

Write 148 on reader service card