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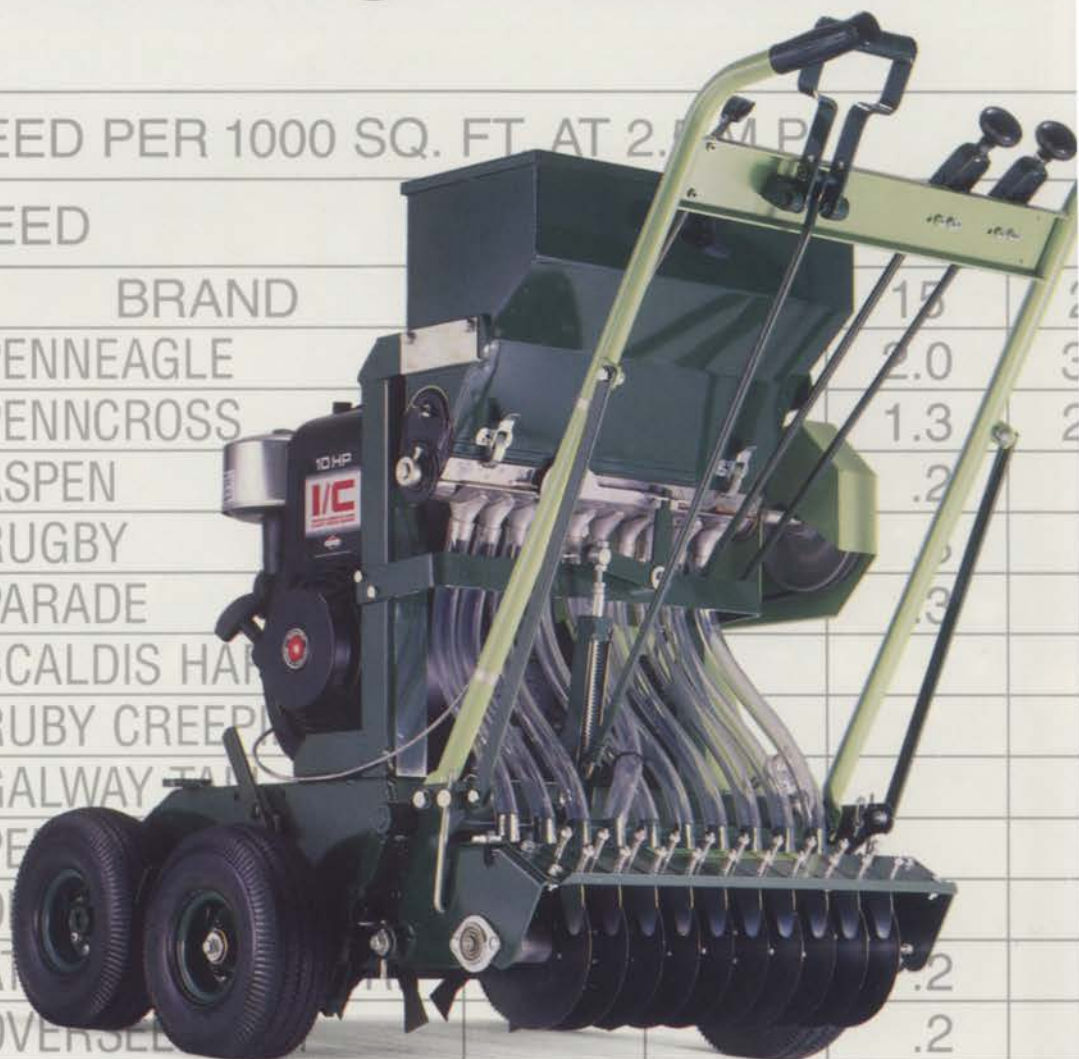
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Exclusive trade show hours, a barbecue and a city that never sleeps awaits PLCAA attendees.



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EDITOR'S FOCUS

EXHIBITORS AND ATTENDEES

alike take special care when deciding which industry trade shows to attend. Without this critical decision making, the arduous trade show circuit can easily overtake the sole purpose of participating in such shows.

The best example of this comes in a three-week stretch in November when more than a half dozen national and regional trade shows vie for the attention of similar vendors, speakers and attendees.

But a positive step in trade show consolidation came recently when three national organizations, representing the core of the lawn and landscape maintenance industry, made a wise decision to combine their efforts into one, developing what promises to be a stable, financially sound and educationally solid convention and trade show.

The result of this act will culminate in Nashville, Tenn., November 1990, when the Professional Lawn Care Association



of America, the Associated Landscape Contractors of America and the Professional Grounds Management Society produce the first Green Industry Exposition. So none of the associations involved

will be stripped of their individual identity, separate educational tracks will remain targeted to the members of each association. The combined trade show, however, will be overseen by a nine-person steering committee representing the industry and the three associations. The PLCAA will act as show management.

The consolidation is not only natural, but necessary, and comes just in time for the 1990s — a decade which surely will bring substantial changes to the lawn and landscape maintenance industry.

As the industry's trend toward service diversification speeds up, it makes good sense for associations representing industry leaders and shapers to design one national show covering the needs of the growing majority of their members. The new show will enable attendees to preview a much wider variety of products, attend a medley of educational sessions and share experiences with a wider range of their peers. — *Cindy Code* ■

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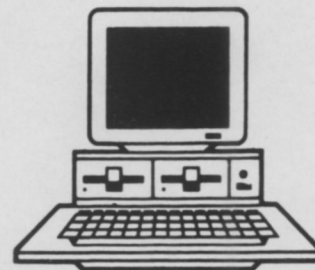
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SIMPLICITY BUYS MIDDLESWORTH ENGINEERING

Simplicity Manufacturing Inc., Port Washington, Wis., recently acquired Middlesworth Engineering and Manufacturing Inc., Greentown, Ind., for an undisclosed price.

Middlesworth produces a line of commercial mowers, including several models incorporating a patented hydro steering design. The company had sales of approximately \$500,000 in 1988.

"This purchase expands the Simplicity product range to include highly maneuverable machines that appeal to both professionals and the increasing number of homeowners buying commercial-quality equipment," said Warner Frazier, Simplicity CEO. "It will enable Simplicity to participate in the growing professional turf maintenance market."

Production of Simplicity's new equipment line will be moved to Port Washington this fall.

The units are designed for efficient maneuvering around plantings and obstacles common to parks, building sites and large landscaped areas, Frazier said. All machines in the line, ranging from 16- to 20-h.p., feature zero turning radius, allowing operators to pivot the units in a full circle around either drive wheel.

Simplicity will offer the units with either a lever control or steering wheel design.



Simplicity now owns a full range of commercial mowers.

"The ability to offer this exclusive option and Middlesworth's reputation for durable, high performance machinery, attracted us to the company," he said.

Founder and developer of the patented steering design, Tom Middlesworth, will join Simplicity in a senior engineering position.

NEW TECHNOLOGY PROMISES GRASS IN LESS THAN SIX WEEKS

Minute Grass, a lighter, more flexible pregrown grass is expected to enter the U.S. marketplace this year.

A world patented product, Minute Grass uses a technology involving the mixing of a customer's choice of grass seed with bark containing natural resins. The seed is then spread mechanically over a perforated microplastic film and watered daily as needed.

Within a few weeks, Minute Grass blooms into consistently thick grass, remaining green year-round without ever touching soil. Because Minute Grass is grown densely above the ground's surface, its root system is not susceptible to

weeds and other impurities.

Developed in 1974 in Les Landes, France, by inventor Michel Chamoulaud and marketed under the French name Gazon Minute by Darborne Corp., Minute Grass has dominated the European marketplace and has been used on stadiums, public roadways, parks, schools and golf courses. In France, some 28 stadiums and 20 golf courses use Minute Grass.

Minute Grass is three times lighter than sod, three times more prolific in a growing season and reportedly has the ability to be stored under 29 degrees refrigeration for up to six months, compared to traditional sod which has no storage life.

Minute Grass' lightweight system makes it possible to grow grass on elevated road bridges, rooftop parking structures and any other place where weight is a primary consideration.

Because it's so easy to grow and maintain, Minute Grass significantly reduces downtime at professional sports facilities.

Mud-free, it can even be grown indoors under artificial light, making it ideal for hotels, malls, halls, amusement and theme parks.

Minutegrass is available in 2 feet by 3 feet squares or in seamless rolls of 15 feet in length. Specific size dimensions of the grass carpet may be ordered in any size desired.

TRU GREEN SELLS PRO TREE & TURF EQUIPMENT

PROFESSIONAL TREE and Turf Equipment, Golden, Colo., formerly Denver Leasing and Manufacturing, is now under new ownership.

Tru Green Corp., Alpharetta, Ga., sold the company to Steven Tangsrud and Dan Sundquist Sept. 1 for an undisclosed sum. Tru Green bought the company about one year ago with the acquisition of Ever-Green Lawns, Golden, Colo. Ever-Green is still owned by Tru Green.

Tangsrud and Sundquist have been with the company since it was first started as Denver Leasing and Manufacturing in 1983 by Ever-Green Lawns. Tangsrud was manufacturing

manager and Sundquist was sales manager and past general manager of Pro-Turf Manufacturing.

In 1987, the name was changed to Professional Tree and Turf, a year after Ever-Green's buy out of Pro-Turf Manufacturing of Illinois.

The Illinois facility has since been closed and the company's headquarters are located in Golden, Colo.

Professional Tree and Turf specializes in the custom manufacturing of spray trucks, from small units for pickups to full size tanker trucks. In addition, the company manufactures a full line of parts and accessories such as spray guns, pumps and

reels.

An expanded parts inventory at Professional Tree and Turf is planned by Tangsrud and Sundquist.

The new owners hope to introduce a chemical injection unit in December which will enable operators to automatically mix pesticide products on site. Prototypes of the unit are now being tested, but a definite distribution date has not yet been set.

While there are similar units on the market, Sundquist said, this unit will enable the operator to automatically mix products at both low and high volume and low and high pressures — up to 1,000 psi.

PETERS LEAVES ALCA POST; REPLACEMENT SOUGHT

Terry Peters, former executive director of the Associated Landscape Contractors of America, has left the association to take a similar position with another group.

The parting between ALCA and Peters, who had been executive director for four years, was amiable, according to Ron Kujawa, president of ALCA.

An ALCA search committee has been established to find Peters' replacement, but the association is under no pressure to find a successor, Kujawa said.

"We have a competent, dedicated, completely professional staff which gives us the luxury we need in finding a replacement," he said.

The executive director should have strong interpersonal skills, good marketing abilities and the capability to lead the association into the 1990s and beyond, Kujawa said. The position is open to someone in the landscape maintenance industry or a similar industry.

Kujawa said the open position wouldn't have any effect on the association's national trade show, just one month away.

PLCAA SCORES WIN IN MILFORD PESTICIDE REGULATION BATTLE

The Professional Lawn Care Association of America gained some ground in its fight against unreasonable regulation of pesticides with a recent court win in Milford, Mich.

The city of Milford, which was trying to impose harsh regulations, was overruled by the U.S. District Court in Detroit. The summary motion issued by the court prevents the city from enforcing its ordinance because it was considered above and beyond what Congress intended when it passed the Federal Insecticide, Fungicide and Rodenticide Act. Milford has the opportunity to appeal the ruling, but no such petition had been filed at press time.

A Federal Court ruling in Maryland more than two years ago stipulated that such laws are unconstitutional when enacted by municipalities, but many cities continue to oppose the decision.

Milford's ordinance sought to regulate activities of pesticide operators by requiring them to annually register with the city, costing them \$15 each year; supply company decals to the business where an application occurred, where it would be posted for at least 90 days or until the next application; orally notify residents who have been determined to be "chemically sensitive" 24 hours in advance of an application; and post signs indicating a residence has been sprayed, warning people to remain off the yard for 72 hours.

PLCAA's suit against Milford is an in-

dication of what the association plans to do in retaliation to ill-conceived and irrational ordinances initiated by local governments. Steps have already been taken in Michigan to institute some form of statewide posting regulation. Negotiations are under way, but no regulations have been set in place.

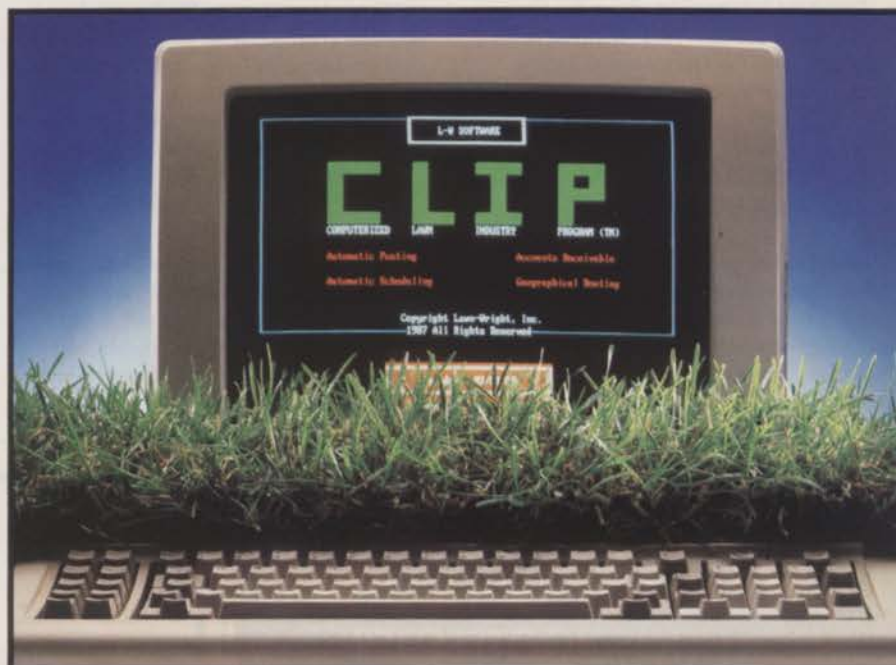
DOW SETS FOURTH QUARTER MANAGEMENT SEMINARS

Business management seminars for lawn maintenance operators have been an-

nounced for the fourth quarter of 1989 by The Dow Chemical Co.

Seminars are set for Oct. 18, in conjunction with the Colorado Association of Lawn Care Professionals, Denver; Dec. 11, Rochester, N.Y.; Dec. 12, New Jersey; Dec. 13, Pittsburgh, Pa.; and Dec. 14, Harrisburg, Pa.

The one-day programs provide extensive information on financial planning for 1990, creating a meaningful profit and loss statement and landscape maintenance bidding. They feature respected industry consultants Ed Wandtke and Rudd McGary, senior partners for All-Green Man-



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agement Associates, a Columbus, Ohio-based consulting firm.

Seminar leader Rudd McGary, Ph.D, specializes in marketing and market development systems and management systems. He has been consulting for service companies for more than 15 years and has been CEO of two operating companies.

Co-seminar leader Wandtke, CPA, MBA, specializes in operations, acquisitions, financial planning and compensation systems development. He has more than 20 years of company operating experience, including serving as operations manager and corporate financial manager of ChemLawn.

For more information about the October meeting contact: Jack Watkins, 913/451-2000. For the December meetings contact: John Peterson, 609/234-0400.

JONATHAN GREEN EXPANDS WEST COAST RESEARCH FACILITIES

Jonathan Green & Sons Inc. has expanded its commitment to research and development of quality grasses by moving its Oregon division, Cascade International Seed Co., into a new office and research station.

TECUMSEH EXPANDS ENGINE LINE

TECUMSEH PRODUCTS CO. RECENTLY acquired Tecnamotor S.P.A. of Torino, Italy.

Tecnamotor is Europe's leading manufacturer of gasoline engines for lawn and garden applications. Tecnamotor has more than 700 employees in Italy, the United Kingdom, West Germany and France and supports its product through more than 5,000 authorized service dealers across Europe.

Sales in 1988 exceeded \$78 million.

Tecnamotor has been a licensee of Tecum-

seh technology since 1960. From 1982 to the present, Tecnamotor has operated under a successful 50/50 joint venture between Tecumseh Products Co. and Fiat.

Tecumseh's President and Chief Executive Officer Todd Herrick, said that the Tecnamotor acquisition, together with the Dec. 30, 1988 acquisition of L'Unite Hermetique of France, establishes Tecumseh as a significant Pan-European company in both the compressor and engine sectors of its business.

"Cascade is responsible for production and contracting of new seed varieties used by Jonathan Green & Sons Inc.," said Irv Jacob, president of Cascade. "This new facility will allow us to control production of foundation seed and evaluate new varieties for seed yield capability before they go into commercial production."

The new research farm is located one-half mile south of Aumsville, about 10 miles south of Salem. The soil is ideal for production of seed and comes complete with its own irrigation capabilities.

One of the first projects will be to

evaluate some 80 plant types of Kentucky bluegrass. These new selections are being screened for seed yield, quality, disease resistance and sod growing.

Cascade will conduct research projects for a number of other major organizations.

THORNTON, STEINER DONATE EQUIPMENT TO OSU/ATI

The Ohio State University Agricultural Technical Institute, Wooster, was the re-

(continued on page 10)

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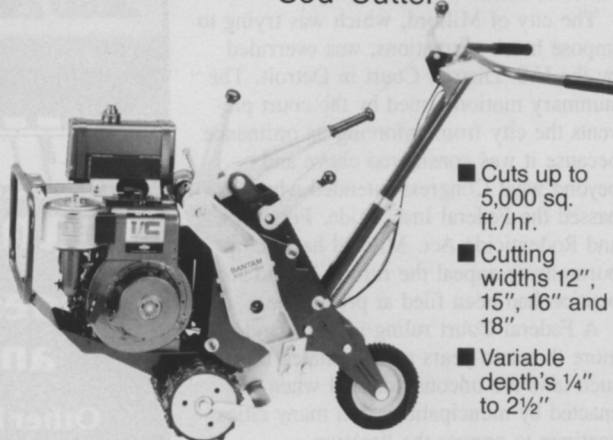


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PROFESSIONAL LAWN CARE ASSOCIATION OF AMERICA SPECIAL 10TH ANNIVERSARY CONFERENCE & SHOW NOVEMBER 6-9, 1989

LAS VEGAS

Nov. 6-9

OUR 10TH ANNIVERSARY



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Don't let the future be a gamble! Plan for your company's growth into the next decade by being part of THE EVENT of the lawn care season: the 10th Anniversary Conference and Show of the Professional Lawn Care Association of America. Bet on a sure winner — **PLCAA/Las Vegas '89!** — four unforgettable days in the entertainment capital of the world. Non-stop excitement, education, celebration and jubilation await you November 6-9!

• **CELEBRATE!** PLCAA's Conference and Show is always the lawn care industry's event of the year, but **PLCAA/Las Vegas '89** will be something special — the official 10th Anniversary celebration of the founding of the Professional Lawn Care Association of America. You won't want to miss the exciting 4-day round of special events planned to mark this milestone in lawn care history.

• **EDUCATE!** Three tracks of education will help you "Plan Your Business" into the '90's, with discussions of employment, water, finances, government regulations, and pesticide safety. Ample opportunities will allow for informal information exchange among colleagues.

• **EVALUATE!** The latest in lawn care products and technology await your inspection. Over 160 manufacturers, suppliers and distributors will be on hand, eager to answer your questions and demonstrate the tools you need to keep a competitive edge.

Each morning of the Conference and Show we will present a New Product Expo. Learn what will be state-of-the-art in the 1990s and how your business can profit from new technology and new chemistry.

• **PARTICIPATE!** This 10 year celebration of lawn care comes around only once, so don't miss it! Don't wait to hear about it from your friends, be there to experience for yourself what all the excitement is about. Experience Las Vegas, spectacular showplace of America where the Stars come out to play every night.

Watch your mail in early summer for registration information, or call PLCAA for information 1-800-458-3466, and mark your calendar for a trip to Las Vegas!



YES! I'M INTERESTED IN PLCAA/LAS VEGAS '89!

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Both hardware and software were donated to the university by Thornton in cooperation with Altos Computer, makers of the hardware supplied with *Slice* systems, making the OSU/ATI the only university in the United States to have the complete system.

Steiner leased the state of the art tractor to the university at no cost for use in the newly established Horticulture Power and Equipment technology department. Steiner expects to replace the equipment on a yearly basis.

In addition to the tractor, Steiner donated a model RM74 triplex reel mower; MR473 rotary mower; BD260 power angle blade and DE160 disc edger.

MORE THAN 180 GROWERS ATTEND PURE SEED/TURF-SEED FIELD DAY

Grass seed producers, distributors, educators and turf management professionals attended the recent two-day Turf-Seed



Warren Kronstad speaks to attendees at the recent Turf-Seed/Pure Seed Testing field day.

Inc./Pure Seed Testing Inc. Field Day in Hubbard, Ore.

The first day featured seed yield trials highlighting new, cool-season turfgrasses and a presentation on endophyte. More than 180 growers attended the trials.

Day two followed with a tour of the 105-acre research facility and viewings of Kentucky bluegrass, perennial

ryegrass, fine fescue and tall fescue maintenance trials as well as wildflower plantings.

The eighth annual field day will be June 20-21.

For more details and a registration card, call Turf-Seed at 800/247-6910. Or write: Turf-Seed, P.O. Box 250, Hubbard, Ore. 97032. ■

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ASSOCIATION NEWS

THE AMERICAN ASSOCIATION OF Nurserymen assisted U.S. Senator Wyche Fowler Jr., D-Ga., with writing the Municipal and Industrial Water Conservation Act of 1989.

Intended to respond to the water crisis of the 1980s by making wiser use of water resources, the bill proposes the establishment of the Office of Water Conservation in the Environmental Protection Agency. The bill includes emphasis on the water efficiency of landscaping and vegetative cover.

The AAN's involvement in the bill represents another step toward the recognition of the nursery industry as an advocate of more cautious water use in the United States, said Ben Bolusky, AAN's director for government affairs.

"This legislation will send an important message to the American people: That landscaping is a vital way to participate in water conservation activities, over and above the fact that it adds beauty and value to one's property," he said.

Similar legislation has been introduced in the House of Representatives.

The Professional Lawn Care Association of America has adopted a new policy for franchise operators and international companies to join or renew their PLCAA memberships.

Franchisors can join or renew by paying annual membership dues based upon the systems-wide sales dollar volume of the franchise while franchisees can join or renew by paying a reduced fee, based on the direct costs of supplying membership mailings.

Any lawn maintenance company based outside the United States will be considered eligible for a PLCAA membership as an international member. They will be eligible for privileges and voting rights of

the regular membership, provided that all the criteria for the regular classification of membership has been met.

International members are eligible for a flat rate membership fee, rather than one based on sales volume. The policy will allow international members to support local or national organizations concerned with national lawn maintenance issues and professional development.

The Environmental Protection Agency has developed the "Personal Protective Equipment for Pesticide Applicators: Guide to Sources."

The guide is intended to help pesticide applicators and those involved in training or assisting applicators, especially state pesticide coordinators and regulatory officials. It was developed in response to studies showing that a lack of information about where personal protective equipment could be purchased was a contributing factor to occupationally related skin diseases.

Divided into seven sections with each section broken down by state, the guide's information includes: suppliers and distributors, manufacturers and their sales representatives, sources of available chemical protective clothing and gloves by fabric type and sources of certified respirators.

The guide costs \$28.95 and can be ordered from the **National Technical Information Service**.

The **Lawn Institute's** Board of Directors elected its executive committee at its annual meeting held recently in Washington, D.C.

The new president is Mike Robinson, president of Seed Research of Oregon Inc., Corvallis, Ore. Elected vice president was Doug Toews, product production and advertising manager

for International Seed Co. Inc., Halsey, Ore. Doyle Jacklin, Jacklin Seed Co., Post Falls, Idaho, was re-elected secretary/treasurer.

Others on the executive committee are: Robert Peterson, R J Peterson Enterprises, Hillsboro, Ore.; Norman Rothwell, Rothwell Seeds Ltd., Lindsay, Ontario Canada; and Robert Russell, J & L Adikes Inc., Jamaica, New York.

The Indiana State Lawn Care Association is actively involved in a training program for lawn maintenance applicators.

Before commercial applicators apply turf pesticides without on-site supervision, they must obtain a registered technician license from the state chemist. To get that, they must finish a 14-day on the job training program supervised by a certified applicator in their company. After that they must pass a workbook exam related to turf pesticide applications.

The ISLCA publishes a training manual to prepare for the exam. It covers introductory information in about a dozen areas of lawn maintenance ranging from grass identification to the legal obligations of pesticide applicators to calculating the size of turf areas.

The ISLCA schedules the review and testing days throughout the state to coincide with the normal fluctuations in hiring in the lawn maintenance industry. Exam results are available about 10 days later and a registered technician credential is issued. The license is good for one year.

The 29th Annual Illinois Landscape Contractors Association Summer Field Day recently attracted 1,550 participants.

Hosted by Kankakee Nursery, Aroma Park, Ill., the event included 185 booths from 146 exhibiting firms representing a wide range of landscaping supplies of plants, equipment, containers, hardgoods, insurance and various services.

Activities included narrated, open-wagon tours around Kankakee's 900-acre production site. Tractors, hydro-seeders, mowers and chain saws were among products shown at the equipment demonstration.

Next year's event will be hosted by Ball Seed Co. ■

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FOCUS ON: LANDSCAPE

LANDSCAPING FIRMS RECOGNIZED WITH BEAUTIFICATION AWARDS



Pardee & Fleming Landscape Design Corp. won the Judge's Award for best residential landscape.

KOYAMA LANDSCAPING OF Temple City, Calif., received the top landscaping award and other landscape installation and maintenance contractors were honored at the 33rd Annual Landscape Beautification Awards Banquet hosted by the California Landscape Contractors Association.

Special awards were presented to: Koyama Landscaping, Temple City, which received the Sweepstakes Award for the best in all categories; Tierra Verde, Arcadia, was the recipient of the Excelsior Award, recognizing the best entry by a new member; Pardee & Fleming Landscape Design Corp., Malibu, received the Judge's Award for the best residential landscape; and Kono Landscape Service, Los Angeles, was awarded the President's Award for the best maintenance

project overall.

In addition, Bettina Plantlife, Culver City, was the recipient of the Colorscape Award for best use of color; Statice Landscape & Design, Los Angeles, received the Special Effects Award and the Landscape Lighting Award for the best use of unique materials and the best use of lighting at night; and Arboretum Landscape, Los Angeles, was awarded the design and build award.

Other award winners for landscape installation included: Cornell & Wiskar Landscaping, Los Angeles; Britton Landscaping, Pasadena; Bettina Plantlife, Culver City; multiple award winner Statice Landscape & Design, Los Angeles; Rossmoynne Landscaping, Glendale; Brian Johnson Landscape, Los Angeles; Koyama Landscaping, Temple City; Garden View, Sierra Madre; Iwasaki Landscaping, Los Angeles; double award winner Mariposa Landscape, South El Monte; and L. Barrios & Associates, Irwindale.

Toddco Landscaping Co. Inc. of Venice was recognized for its work at the new pavilion for Japanese Art at the Los Angeles County Museum of Art.

In the area of special landscape installation, winners included: Cornell & Wiskar, Los Angeles; Mariposa Landscape, South El Monte; and Plantique,

Inglewood.

In the field of landscape maintenance, winners included: Mike's Landscaping, Torrance; Bettina Plantlife, Culver City; Mariposa Landscape, South El Monte; triple winner L. Barrios & Associates, Irwindale; and triple winner Iwasaki Landscaping, Los Angeles.

Robert Sapien of Robert E. Sapien & Associates, Culver City, was awarded the second annual Rose Marie Head Humanitarian Award.

The Rose Marie Head Humanitarian Award was created in memory of Head, former founder and president of Four Seasons Gardens in Compton, and past president of the California Landscape Contractors Association. She was the only woman to serve in that capacity in the statewide association.

The community service recognition award was presented to Four Seasons Gardens for outstanding contributions to the community in the elaborate relocation of a 100-year-old magnolia tree transplanted to Secoombe Lake Park in San Bernardino. Four Seasons Gardens donated more than 50 percent of the labor and materials in the project.

The judging panel consisted of Don Hill, Don Hill Nurseries, Reseda; landscape architect Steven Ormenyi, Steven Ormenyi & Associates, Los Angeles; and Wally Weaver, Associated Irrigation Consultants, Los Angeles.

The 36-year-old Los Angeles/San Gabriel chapter of the CLCA is part of a Sacramento-based statewide organization, which is also affiliated with the National Association of Landscape Contractors in Washington, D.C.

The association actively promotes public awareness of landscape contracting in addition to establishing professional standards, working closely with the state legislature and developing continuous education programs. Chapter President Robert Cornell said the awards ceremony underscores the dynamic activity of the LA/SGV chapter of the CLCA with its recognition of outstanding achievements. ■



Arboretum Landscape, Los Angeles, Calif., won the design and build award for a residence in Los Angeles.



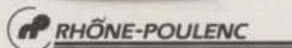
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DEEP ROOT SYSTEMS MAKE BUFFALOGRASS ATTRACTIVE FOR TURF USE



Because of its low-maintenance requirements, buffalograss has generally been used in the less populous Central and Great Plains regions of the country.

BUFFALOGRASS, A FINE-LEAVED variety, is native to the Central Plains and Great Plains — stretching from the Dakotas to Texas — because it does well in alkaline soils and adapts well to other low fertility soils. It's also resistant to cold, heat and drought.

Advantages of buffalograss include fine-

textured leaves and excellent root systems — much deeper than bluegrasses — that make it attractive for lawn and turf uses. Maintenance studies have shown that mowing every three weeks at a 2 1/2-inch height is good. Most seed heads form in June so mowing is important at that time.

Buffalograss is spread by stolons, elongated horizontal stems that grow above the soil surface and root at the joint of the stem. New shoots elongate above-ground rather than below as with grasses spread by rhizomes.

Disadvantages, though, are noteworthy. Seed cost is high because the seed is born close to the ground making the harvest difficult and costly.

A slow establishment period of one to three years, depending on competition, often results because the roots grow first before the tops develop. It has a short growing season of about three to four months, which is halted by the first frost.

Color is a deterrent to some people.

During dormancy, it's brown and becomes only a light green during its peak growing season.

The Texoka variety can be seeded at a rate of one pound of pure live seed per 1,000 square feet. There are about 50,000 seeds per pound of one-quarter inch burrs. The seed is about two millimeters in length and each burr usually has five to six seeds. Cost varies from about \$10.50 to \$11.25 per pound.

Relatively light fertilization is needed. About one pound of nitrogen per 1,000 square feet applied annually is adequate and two pounds at the most is needed. Actually, in many cases no nitrogen is needed.

Buffalograss is propagated by plugs, sprigs, sod and seed.

Selections are now being made to improve a number of buffalograss characteristics.

These evaluations are taking place in Nebraska, Texas, Colorado and New Mexico. — *The Lawn Institute*

BUFFALOGRASS AVAILABILITY TO INCREASE WITH NEW RELEASES

THE MARKET FOR BUFFALOGRASS is growing because people are beginning to recognize its benefits. As a result, research is under way to develop new varieties that could make it suitable for commercial turf usage.

Traditionally, because of its low maintenance requirements and short growing season, the variety has been used in the less populous Central and Great Plains regions of the country for highway rights-of-way, cemeteries and athletic fields.

A new variety named *Prairie*, developed by Milt Engelke, associate professor of turf breeding and management at Texas A & M University, has been released for certified production and should be available to the commercial market next August.

This will be the first turf-type buffalograss released. It has improved density, stand and uniformity and is an aggressive

growing, Engelke said.

The variety is grown vegetatively and will establish in about six to eight weeks. Its color is not as dark as bermuda or bluegrasses, but it does green-up earlier in the spring and stays green somewhat further into the fall.

Like all buffalograsses, *Prairie* has good heat dissipation and absorption. Being tested on a homeowner's lawn this summer in Dallas, the grass survived about 30 days of no precipitation and no irrigation, Engelke said.

"With what I'm seeing coming out of *Prairie* and other varieties being tested, buffalograss will play a significant role probably within the next five years because of reduced water requirements," he said. "Also because it has a broad area of adaptation."

Outside the traditional growing area of the Plains, Engelke said, he has had good results

with the grass on the Gulf Coast, and has even had someone from British Columbia, Canada, express interest in trying to grow it there.

The grass will work well on home lawns, but lawn and landscape maintenance operators will have to be aware of the lower maintenance needs.

"It will be an excellent alternative," Engelke said. "But it is not going to be the salvation of the turf industry; it is not a miracle grass. People will have to be tuned into backing off the traditional fertilization rates."

Nebraska's horticulture department has patented three new varieties which will be available to different growers next year, said Terrance Riordan. These varieties have more turf qualities than other buffalograss including a darker color that comes up earlier in the spring and lasts later into the fall, a lower growing height and bet-

ter density. These are all female varieties.

The females seem to have a brighter future than the males. They are shorter and more dense which means they don't need to be mowed as often. The males produce a taller and more open inflorescence which requires more maintenance.

While the market right now is relatively small — about 500,000 pounds of seed a year — the low maintenance requirements will be the major market booster over the next several years.

Buffalograss now costs about \$10 to \$14 per pound, Riordan said, but increased production in the next few years could bring the price down.

Engelke wouldn't speculate at what price *Prairie* might enter the market, but he did say it will have a premium price starting out because of limited availability. After several growing years and increased acreage, it will probably decrease.

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"Monster Begonias" Create Spectacular Landscape Site

HE'S NO DR. DOOLITTLE, BUT BOB BARNES' ABILITY to communicate with nature has raised the level of flower growing to new heights — world-record heights as a matter of fact.

Barnes, the horticulturist version of the famous storybook animal doctor, has made growing "monster begonias and impatiens" a way of life — an extremely successful one at that.

"If they're not talking to me, we're in trouble," said Barnes of his flowers. "But if everyone's talking, then we're OK."

Begonias and impatiens are almost like children to this self-named "floral architect." He prepares their beds, carefully places them in their living quarters, supervises their health and growth and knows when to call it a season — a season which runs from late May until the year's first frost.

His tallest offspring have reached the lofty heights of 52 and 32 inches, respectively, for his impatiens and begonias.

The fondest greeting Barnes has for his flowers is a shake on the head. If they respond with a clatter, similar to a crisp head of lettuce, he knows they're doing OK, and that's all he needs to know to keep the flowers, his customers and himself satisfied.

Barnes started his landscape career working for his dad's maintenance business. Since he's been old enough to pick up sticks and stones, Barnes has been communing with nature.

Working with his dad through high school, Barnes learned a variety of skills including mowing, installation and an assortment of maintenance services. He earned his first solo break after graduation when he was hired as an assistant groundskeeper at the Village in the Park apartment complex in Westlake, Ohio. His chief responsibilities were to oversee the complex's tree and turf programs, but it wasn't long before he gradually began working in his artistic flair for growing flowers.

"They were looking for something different and I was looking to be noticed," Barnes said.

His first attempt resulted in a small, but eye-catching display. It was in his second year, however, that he started receiving the publicity which today has put him in high demand.

Before he knew it, the word of Barnes' "flower magic" spread quickly, particularly through his employer, Western Reserve Property Management Co., an owner of a number of apartment and office complexes. He was soon on his way to developing and maintaining flower beds on a variety of commercial and residential properties.

Over a six-year-period, the demand for his flowers and masterfully designed flower beds grew so large that he couldn't maintain both his groundskeeper job and his real avocation. So in 1983, he left Western Reserve and formed Creative Annuals located in North Ridgeville, Ohio.

While he still does some tree and turf troubleshooting for Western Reserve, Barnes isn't in the



CREATIVE ANNUALS

Headquarters: North Ridgeville, Ohio.

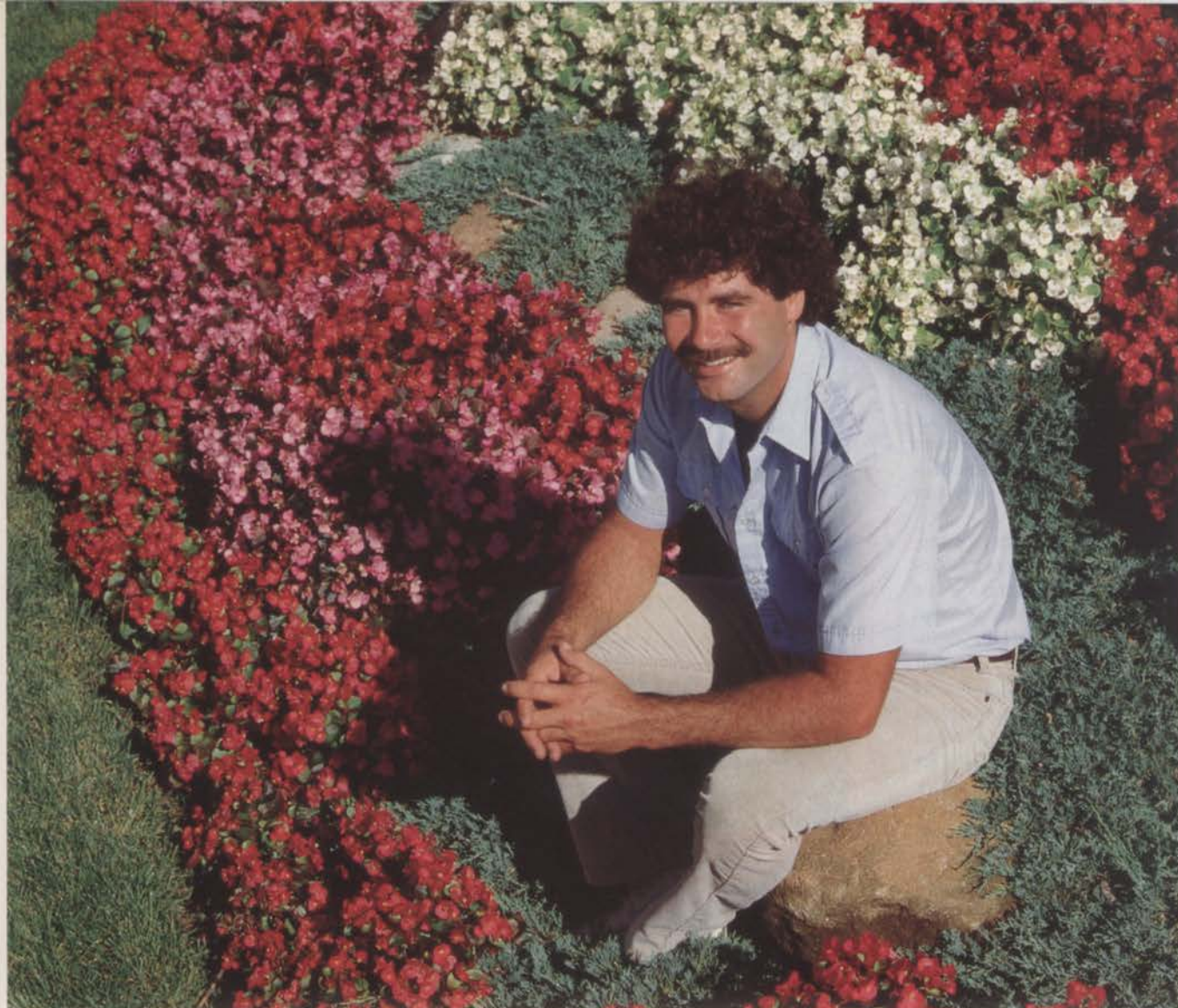
Founded: 1983

Owner: Bob Barnes.

Primary Services: Design, installation and maintenance of begonias and impatiens. Limited tree and turf maintenance.

Employees: Three during peak months.

1988 Sales: More than \$100,000.



One of Bob Barnes' favorite design sites. Here he sits among his colorful begonias at the Plaza South office complex, Middleburg Heights, Ohio. The property is owned by the Flair Corp.

Photos: Mickey Jones

business of tree and turf care for the majority of his customers. And even though the two parted ways, Barnes remains loyal to his first employer, installing and maintaining flower beds on several Western Reserve properties.

Employing only two others during peak season, Barnes plants more than 150,000 flowers in a three-week period. "We're good at it," he said. "With our soil, we can plant about 14 to 15 plants a minute."

Creative Annuals now has about 10 commercial customers totaling 75 flower beds and about four residential customers. Residences don't fit into the company's regular scheme unless the homeowner agrees to give Barnes free rein over the flowers.

When planting begins at the end of May, the begonias are about 4½ inches tall. Flower beds are generally prepared the fall before planting so Barnes doesn't have to worry about an excessively wet spring.

In the fall, Barnes puts down some soil and shrubs, and will even plant tulips if the customer desires spring coloring before the begonias are installed.

No authentic Barnes flower bed is complete without a specially designed stone wall — something which, next to the begonias, has become a company trademark.

But the secret to his success is not his plants, installation techniques or even his good fortune, but a soil-less mix containing a top-secret amount of fertilizer.

Barnes uses a completely organic mix consisting mainly of leaves, manure, grass clippings, pine needles, wood chips and a precise amount of fertilizer, whose quantity has been developed over a two- to three-year period.

"I'm real big on high fertilization," he said. "I pump them with

a lot of fertilizer and a lot of water. It makes them a lot more susceptible to disease, but I keep a close watch on them."

It's for this reason that Barnes designs elevated flower beds to give maximum drainage.

"That's basically all it is. If you have too much (fertilizer) it'll burn, and not enough and nothing will grow," he said. "Begonias and impatiens are organic loving plants, whereas petunias and marigolds would rather have a soil."

Barnes' first fertilizer treatment comes before the plants even reach the ground. Once the flowers are planted, they receive a dose of liquid fertilizer about every four weeks.

Without revealing any top-secret information, Barnes explained the process behind his soil-less mix. He begins the mix with separate piles of each of his main ingredients. Once a year, he combines them into one large mound where they remain until spring when the ingredients are mixed twice and dumped in trucks for distribution at each site.

The organic mix is then rototilled into the flower bed's existing soil. Every other year, Barnes said, he has to replace all of the dirt at every site because the organic materials rot away.

"I did this every year at Village in the Park. After four years, the dirt got so good; it was mostly organic. I decided to forget the dirt and go with the organic," he said. "It's hard to grow monster begonias in dirt; the soil held too much nutrients. In soil-less, there's less chance of it (fertilizer) burning because it goes through the soil so quickly."

A clay soil may provide the plant with more water in the first inch of its root zone, but the soil-less mix promotes deep root growth, requiring long and deep watering, rather than frequent watering.

"When we first plant them, we water every other day, but by July 1, the root system is half the size of a basketball," he said.

Because the soil-less mix renders the flowers more susceptible to disease, Barnes said, he sprays the begonias and impatiens on a preventive basis. He spreads one application of Subdue at the beginning of the season and follows, if needed, once every three to four weeks with another commercially available fungicide.



Bob Barnes said his begonias have no problem developing deep roots in his organic soil-less mix. All his begonia beds, like this one at Westgate Mall, Fairview Park, Ohio, are irrigated. Barnes said the begonias thrive on long and deep waterings, rather than frequent, short waterings. The property is owned by Jacobs, Visconsi & Jacobs Co.

Photo: Mickey Jones

"Disease can wipe out the flowers in six days. When flowers are two-feet-high, you can get stem rot, the flowers will then fall over and die," he said.

Unlike diseases, Barnes said, he has few insect problems with begonias and impatiens.

Despite a few fungus problems and learning to control fertilizer applications through trial and error, Barnes said, he has never really experienced a bad season. In fact, while the Drought of 1988 was a nightmare to many landscape contractors, it was a boon to Barnes.

"It probably was our best year because begonias love hot weather, but we had to make sure they had plenty of water," he said. "Some tiny beds without irrigation died."

Barnes has set world records for the height of his begonias and impatiens, but prefers to keep them in check, averaging 24 to

30 inches high. At this height, the flowers can better withstand rainstorms without falling over.

Rather than grow flowers himself, Barnes buys all of his flowers from a local nursery. At the current maturity level of the company, Barnes said, he would rather buy the flowers than add a completely different set of problems to his business.

"When I'm selling \$1 million, then I'll have a flower range of my own," he said.

The cost of the flowers are added into the customers' fee, a charge which includes a maintenance fee covering April 15 to Nov. 15.

Creative Annuals is only closed down about 2½ months out of the year. From new bed proposals in March to pulling out flowers in November, the company keeps busy. In the off-season, Barnes and his brother, Richard, own a logging business. Richard is also

one of the three mainstays at Creative Annuals.

Barnes has achieved a lot of success from his organic mix — almost too much in some cases as his good fortune with flowers spills over into luck with weeds.

"It's an unbelievable job to weed. The weeds come up like grass," he said. "In the beginning we weed twice a week, but as they (flowers) grow, we weed once a week — we don't jerk the flowers around looking for weeds, we just pull the weeds in sight."

While it takes nearly the impossible to stay ahead of weeds 75 flower beds can create, Barnes said, he hasn't yet experimented with any of the industry's commercially available herbicides choosing, instead, to keep first-hand contact with the weeds at this stage of the game.

Appropriately, it remains a secret as to whether Barnes will market his soil-less mix. He said he would never make it available in large quantities to landscape contractors in order to maintain his company's creativeness and uniqueness. He has considered, however, possibly marketing it in small doses.

Barnes goal is to plant one million flowers in one season and have them look as good as if he had planted two. He estimates it'll take five to 10 years and 30 employees to get there, but for now he's happy where he's at. He'd reach that goal a lot sooner if he gave into the tremendous demand for his services but, Barnes said, that would defeat the purpose of his company's creativeness.

"Our company remains true to our clients. Although we've been asked, we won't work for (our customers') competitors, we'd just be cutting our own throat," he said.

Barnes takes pride in the fact that Creative Annuals isn't just any flower company. He prefers to refer to it as a monster begonia company.

"I've made a business out of begonias and impatiens and that's where I plan to stay," Barnes said. And if a customer tries to talk him into experimenting with new varieties, "We'll consider it only if a customer asks us to, and then we'll talk them out of it." — *Cindy Code*

The author is Editor of Lawn & Landscape Maintenance magazine.

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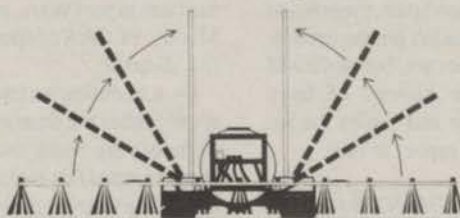
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Exclusive Trade Show Hours Highlight PLCAA's Anniversary

THE PROFESSIONAL Lawn Care Association of America celebrates the 10th anniversary of its annual conference and trade show in Las Vegas, Nev., Nov. 6-9.

Last year's show in New Orleans, La., attracted 185 exhibitors and 1,301 attendees. More than 180 exhibitors and about 1,500 attendees are expected at this year's show.

Exhibit hours during the trade show have been cut back somewhat, but will all be exclusive hours, not competing with educational sessions for attendees' time. Trade show hours this year run from 10:30 a.m. to 3:30 p.m. both Tuesday and Wednesday for a total of 10 hours, down from 14 last year.

The reduction was made because some of the feedback from attendees and exhibitors at last year's New Orleans show said there were too many hours and too many things going on at once, said Jim Brooks, PLCAA executive director.

"We'll see how things go this year," he said. "We'll see if they like it or if they don't."

Running a trade show without having educational sessions scheduled for the same time should make for a better show, said Mike Packer, vice president of sales for Bun-

ton Co., Louisville, Ky.

"You can't run a trade show while a lot of people are at the educational sessions," he said. "There's no use having display people standing around twiddling their thumbs because there's nobody coming by the booths."

Bob Brophy, manager/lawn care product sales for Cushman, Lincoln, Neb., said the reduced hours will benefit exhibitors.

"With the shorter hours, visitors will have to make a concentrated decision about what they want to see," said Brophy, a member of the show's planning committee. "They'll have to see what they really want and need. So the exhibitors will be talking to people who are directly interested in their products instead of friends just stopping by to chat."

Rather than a keynote address, Brooks said, he is planning a multi-media presentation Monday afternoon that will highlight the association's past, present and future. He hadn't put the presentation together yet, but said it will present the history of lawn maintenance and issues the industry may expect to face.

OUTDOOR DEMO. Back for a fifth year is the outdoor equipment demonstration which will be held from 9:30 a.m. to 1:30

p.m. Thursday at Cashman Field Center.

About 30 companies will have their equipment exhibited. Shuttle buses will run from Caesar's Palace, about three miles away.

Outdoor exhibitors include: B & W Sales, Billy Goat, Bunton, C & S Turf Care, Classen, Cushman, Demaco, Encap Products/H.D. Hudson, Exmark, Gravely, Grazer division of M & W Gear, Hahn, Jacobsen division of Textron, Kwik Trench Ditch Digger, Lawn-Boy, LESCO, Minnesota Wanner, Monsanto, North American Micron, Olathe, Perma-Green Supreme, Professional Tree & Turf Equipment, Promark Products, Salsco, Smithco/National Mower/Turfco, Walker and Westheffer.

Changes to the demonstration this year include a barbecue lunch and the demo's timing. The demonstration is not the last scheduled event of the conference as it has been in past years, said Doug Moody, PLCAA's deputy executive director.

By scheduling an educational session after the demonstration, attendees are being encouraged to stick around that evening to take some time to enjoy the entertainment Las Vegas has to offer.

"With Vegas being so far west and the travel times being what

they are, we thought it'd be good to end in the afternoon in hopes that most people will spend the evening and fly out on Friday morning," Moody said.

Moody said the demonstration has gotten a good turnout in the past and he expects that to remain true this year.

"It's always been a good draw," he said. "People seem to enjoy crawling around on the equipment and putting it to the test."

If past years are indicative of the interest in the demonstration, even inclement weather won't keep people away. In the past, attendees have dealt with an impending hurricane in Tampa, 20-degree temperatures in Baltimore and thunderstorms in San Antonio. Only last year, did the weather cooperate fully in New Orleans.

Moody said he expects about 600 to 800 people to take advantage of the demonstration.

SILENT AUCTION. Returning for a second year is the silent auction designed to raise money for PLCAA's issues management fund. Introduced last year, the auction raised \$22,000. It's expected to raise \$50,000 this year, Brooks said.

The silent auction allows attendees to bid for a product, service or piece of equipment from an exhibiting company. The auction is silent because bid boards are located at participating companies' booths. At the end of the trade show, the highest bidder becomes the buyer for the donated product. A major benefit to exhibitors is increased booth traffic, Brooks said.

All involved benefit from the auction. Besides the increased booth traffic, exhibitors are able to support the association's issues management program without making an outright cash contri-

A GLIMPSE INSIDE PLCAA:

What: Professional Lawn Care Association of America 10th Anniversary Conference and Show.

When: Monday Nov. 6 to Thursday Nov. 9.

Where: Cashman Field Center and Caesar's Palace Hotel, Las Vegas, Nev.

Exhibitors: 142 registered as of early September.

Next year's show: PLCAA will join with ALCA and PGMS to host the Green Industry Exposition, Nashville, Tenn.



bution.

Funds from the issues management program will support the association's increased concentration on local, state and federal regulatory and legislative issues.

Participating companies can also write off the donated product or service as an advertising, promotion or trade show expense — all acceptable to the Internal Revenue Service as ordinary business expense deductions.

Bidders can receive the products or services they need most, often at a discounted price, depending on how competitive the bidding becomes.

EARLYBIRD WORKSHOPS. Before the trade show opens, two special 2 1/2-day management training seminars will be held Saturday and Sunday, continuing Monday morning.

"Recruiting and Hiring," presented by Denis Liggins, Employment Insights, is designed to help managers create an action plan for hiring employees. It will include information on how to attract quality employees and where to find them.

In addition to offering ways to improve a manager's interviewing, screening and advertising for



Exhibitors demonstrate equipment at last year's outdoor demo (above and far left). An exhibitor describes his products to show attendees (left).

jobs, Liggins will cover strategies for manpower planning in a seasonal business.

Lawrence Kokkelenberg returns to the PLCAA show to present the second preconference seminar, "Training the Trainer." Barry Troutman, PLCAA's education director, called Kokkelenberg a "consummate trainer." The sessions will include information and tips on how to make company training programs more effective and creative. Also included will be information on how adults learn and process information.

Monday's session will have each participant perform a training session which will be evaluated by the other participants and videotaped to take home.

Monday's Earlybird Workshops are scheduled for 8:30 a.m. to 11 a.m. and again from 1 p.m. to 2:30 p.m.

EDUCATIONAL TRACKS. Educational sessions throughout the conference will follow the popular three-track programming.

In the business track, scheduled sessions include: "Considerations for Full Maintenance" with Phil Christian, All Green Management Association, discussing how lawn maintenance companies should evaluate the benefits and expenses of moving in that direction.

Other sessions will tackle how individuals can develop a career path for themselves and a discussion about drug and alcohol abuse agreements.

Liggins also returns for a session on employee evaluations.

In the water management track, sessions include: Larry Keesen, an independent consultant, discussing "Spotting and Correcting Irrigation Problems" and "Drip

Irrigation of Landscapes." Linn Mills, Nevada Extension Service, will be the speaker for "Water Efficient Plant Materials." He will provide information about what types of plants are best for each region of the country. "Overview of Water Availability" presented by Jay Lehr, National Water Well Association, will round out the track.

The pesticide training track will include six presentations. "Making Effective Applications" will be covered by Jeff Lefton, Purdue University. "Considerations for Calibration" will feature Dave Hanson of Environmental Care Inc. A discussion of how regular maintenance such as mowing and fertilizing can cut down on the need for pesticide applications will be given by John Hall from the Virginia Polytechnic Institute.

Martin Petrovic, Cornell University, will present "Protecting Groundwater from Pesticides." Roger Funk, Davey Tree Expert Co., will be the speaker for "Where We Are in Biological Controls." Harry Niemczyk will present "Injection of Insecticides."

At press time, at least 20 states will allow attendance at these sessions to apply toward pesticide application recertification, Troutman said. He's hoping that by show time that number will have

PLANNING STRATEGIES TO GAIN THE MOST FROM TRADE SHOWS

MORE THAN 41 MILLION PEOPLE ATTENDED 2,700 OF the largest trade shows in 1987, with exhibitors spending nearly \$11 billion and attendees \$12 billion just to meet with one another. However, many attendees waste valuable time and money by arriving at these shows unprepared.

Start planning your attendance strategy 90 days in advance, if

possible. Write down any ideas you may have and be open to input from your co-workers.

Once you're walking down one of those crowded aisles, avoid the tendency to overload yourself with brochures. Talk to exhibitors instead, and take a lot of notes.

Finally, know what to ask.

risen to at least 30 states.

The show begins Tuesday and Wednesday at 7:30 a.m. with the New Product Expo where distributors will have about three to five minutes to show slides and explain their latest products. It's a way for exhibitors to highlight what they have displayed during the show, Troutman said.

Later in the morning a general session featuring Al Calabria, Quigley and Associates, will highlight how to develop a vision for your business. Quigley has helped large corporations with strategic planning and will show how it is also important for smaller companies.

"Everybody needs a vision for their business," Troutman said. "Without it you can't do good

planning. Al has a lot of knowledge and experience to share."

Wednesday's morning sessions will tackle issues in-depth. The tracks will be government and health, people and water and technology.

In the people track, Judy Lannier, Softel Systems, will share the results of a recent survey she performed which questioned 200 lawn maintenance companies about characteristics their top performers possess.

Don Aslet, CEO of Aslet-Browning Inc., will share his ideas and theories of how to develop employee self-esteem in addition to motivating and retaining workers. At the helm of an industrial cleaning company, Troutman called him the "nation's

top janitor." He added that Aslet has tackled these issues successfully in a nonglamorous business and can apply his experiences to the lawn and landscape maintenance industry.

The government and health track will include the latest information and regulations regarding the laundering of uniforms, Department of Transportation and nonpesticide regulations. An afternoon session will cover the hazards and benefits of pesticides. Speakers will be John Law, Chem Lawn; Richard Lehr, Arty Williams, EPA Field Services; Chris Wilkinson, Riskfocus Versur Inc.; and Paul Skorupa, Pesticide Public Policy Foundation.

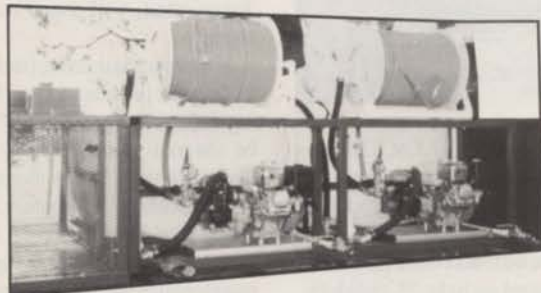
Topics in the water and technology track will be the public rela-

tions of water regulations and protecting groundwater at warehouses. Featured speakers will be: Jay Lehr; Perry Petersen, Terra International Inc.; Glenn Patch, North American Micon. Also included will be a discussion of recycling by three lawn maintenance operators who have faced municipality enforced recycling ordinances.

The general session Wednesday after the outdoor demo will bring back Calabria to demonstrate how to develop action plans for addressing the issues and problems discussed throughout the show. — David Westrick ■

The author is Assistant Editor of Lawn and Landscape Maintenance magazine.

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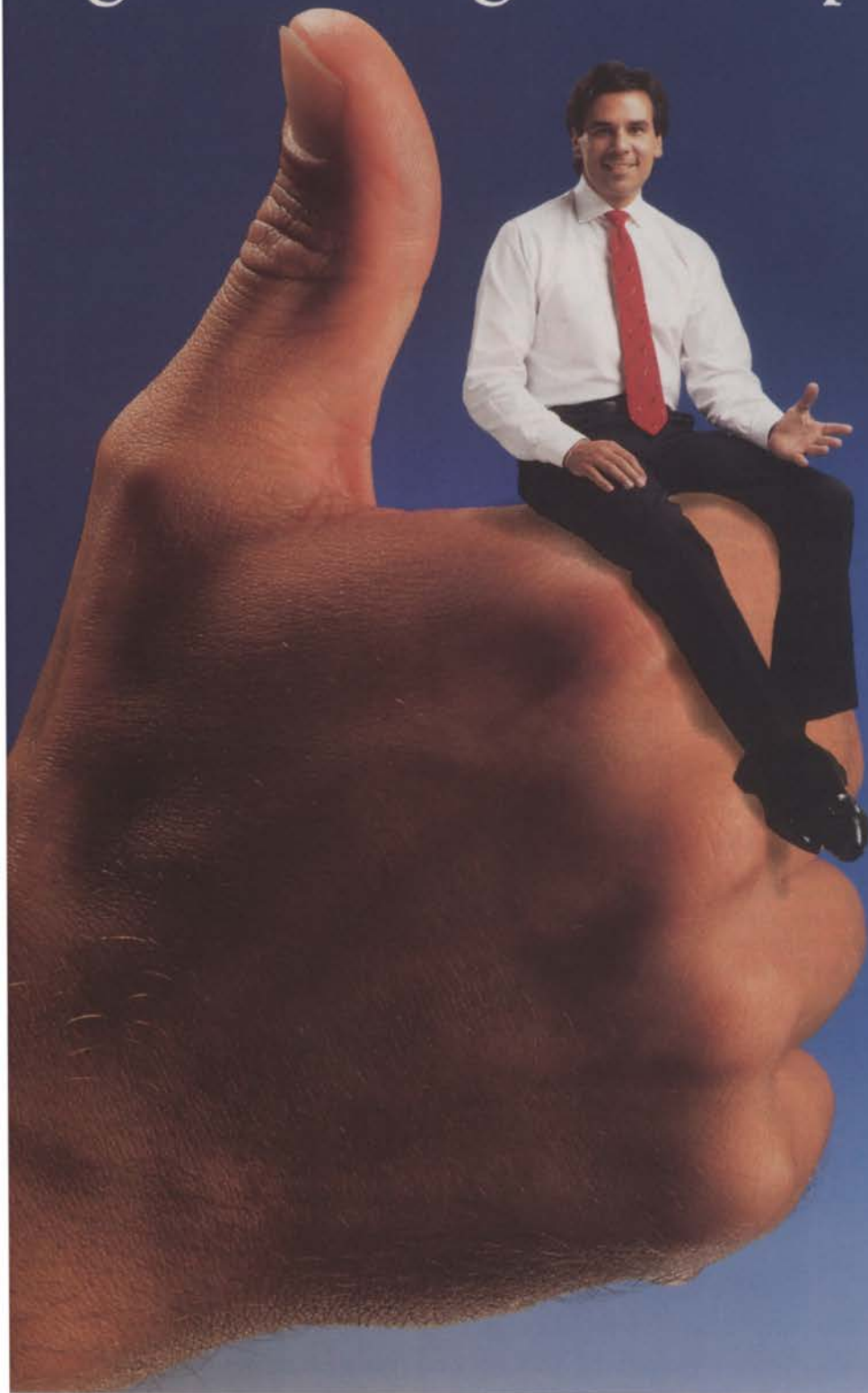
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When Rick Steinau moved up to the performance of TURFLON, his customers gave him a big thumbs-up.



"TURFLON* herbicides give us about 95% control of problem weeds. The standard three-way products give control in the 80-85% range."—

Rick Steinau, president
Greenlon Lawn Care Services
Cincinnati, OH

In the lawn care business, you know that exceptional performance reduces callbacks and cancellations—and costs less in the long run.

Less callbacks.

"We started using TURFLON three years ago," explains Rick Steinau. "TURFLON simply does a better job on the hard-to-control weeds like spurge, oxalis, ground ivy and wild violets. These are the problem weeds that customers usually complain about most. With TURFLON, we've seen a 25% reduction in weed-related callbacks and a 15% drop in cancellations."

More savings.

"We are definitely saving money by using a premium herbicide," continues Rick. "We know that a treatment with TURFLON costs about 50¢ more per lawn than a standard three-way herbicide, but we actually realize a 30% savings in our herbicide program."

Rick Steinau knows that the performance of TURFLON herbicide has made a big, big difference in his business. Just think what it can do for yours. Call us to find out more. 1-800-373-2DOW (2369).

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Gaining the "Winner's Edge" Theme of 4th Green Team

WHILE IT WON'T reach the lofty goal of doubling in size from last year, the 1989 Green Team Conference and Trade Show at the Cervantes Convention Center, St. Louis, Mo., Nov. 9-12, will provide attendees with a wide range of educational sessions and close to 90 exhibitors.

This is the fourth and last Green Team show sponsored in tandem by the Professional Grounds Management Society and the Associated Landscape Contractors of America. The groups reached an agreement in August with the Professional Lawn Care Association of America to combine efforts for one trade show next year.

This year's 13,000-square-foot of floor space is up just slightly from last year, but less than what was anticipated for the trade show, said Allan Shulder, executive director of the Professional Grounds Management Society.

This is mainly because attendance hasn't escalated much in the four years since the show was introduced. Shulder said three other major industry trade shows that take place in November vie for many of the same exhibitors.

"It's a horrendous thing. There are just too many shows in a three-week period," he said. "There's a lot of competition for exhibitors. The irrigation show cost us about



Attendees talk to exhibitors and view products at the trade show.

six exhibitors."

To make the show more attractive, last year was the first time it ran through a weekend rather than all weekdays.

"The jury's still out on that, but we thought it was a good idea," Shulder said. "This way people aren't away from the office as many business days."

But Shulder was quick to point out that most of the expected 500 people attending the show will be managers from large facilities such as universities and parks who are buyers, which will make the

show worthwhile for the exhibitors.

Both Friday and Saturday will start with the Breakfast of Champions introduced last year. Shulder said the event was well received and will be included as part of each attendee's registration. Last year an additional charge was required to participate.

Each 90-minute breakfast provides an opportunity for participants to share ideas and talk about problems in a series of round table discussions.

Topics to be included are: recruiting, screening, hiring and motivating employees; branching out; keeping customers happy; identifying trends for the future of landscape management; training field personnel; marketing landscape management services; selling additional services; and equipment purchasing and maintenance.

The trade show hours are 2 p.m. to 7 p.m. Saturday and 9 a.m. to 2:30 p.m. Sunday. Of the 86 exhibitors at the 1988 show, about one-third were equipment manufacturers, less than one-third were chemical manufacturers, about eight were nursery wholesalers while parts and supply companies made up the balance. Shulder said the percentages should be about the same this year.

KEYNOTE ADDRESS. The keynote address on Friday night will be "The Winner's Edge and the Goal Mind" given by Dayna Waitley, who was nominated by the President's Council as woman of the year for 1985. She has a doctorate in psychology from the University of California at San Diego.

Not much information on Waitley's speech was available at press time — only that she will discuss how to develop critical attitudes for the 21st century.

EDUCATIONAL SEMINARS. Educational seminars are scheduled three per time slot so the attendees' varied interests and concerns are addressed without large gaps of time between seminars they want to attend.

All of Friday's events will take place in the St. Louis Sheraton. Scheduled seminars include:

- "How to Save Money on Insurance" presented by Tom Gar-

(continued on page 28)

A GLIMPSE INSIDE GREEN TEAM:

What: 1989 Green Team Conference and Trade Show

When: Thursday Nov. 9 to Sunday Nov. 12

Where: Cervantes Convention Center, St. Louis, Mo. and the St. Louis Sheraton Hotel.

Exhibitors: About 90 expected.

Next year: Nashville, Tenn. To be combined with the Professional Lawn Care Association of America trade show.

For the cost of a candy bar, Bob Kapp made the sweet move up to TURFLON.



"Our customers expect and demand quality—and we deliver. If it costs an extra 50¢ a lawn to keep customers, it's well worth it."

**Bob Kapp, President and CEO
Kapp's Green Lawn
Munster, IN**

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What price customer satisfaction?

"We switched to TURFLON two years ago because we weren't pleased with our previous herbicide," says Bob Kapp. "Cost has never been a deciding factor in the products we use. The extra 50¢ per lawn for a treatment with TURFLON herbicide doesn't make a bit of difference. In this day and age, you simply have to retain customers—it costs too much money and time to replace them."

Its rewards.

"TURFLON did a much better job, particularly on our problem weeds like wild violets, ground ivy and spurge," Bob continues. "Since switching to TURFLON, we've reduced our weed related callbacks and service cancellations by 50% from a year ago."

With performance like that, you'll be able to add some sweetness to your bottom line. Call us to find out more. 1-800-373-2DOW (2369).

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Green Team

(continued from page 26)

ber, president, Colorado Landscape Enterprises Inc.; Gary Borgman, vice president of finance, Clarence Davids & Sons; Charles Glossop, Green Masters Industries Inc.; Brian Janek of Day, Webb and Tayler; and Marla Rabritch, CNA Insurance Cos.

• "Multipurpose Functions of Hydroseeding" presented by Don Sharp, Finn Corp.; Norman Gray, Transit Seeding Inc.; and Joe Carpenter, Landmasters Inc.

• "Trees — Energy Systems, Phenology" delivered by Alex Shigo, considered to be one of the foremost authorities on trees in the world. During 30 years of working as an arborist researcher, he has studied thousands of trees worldwide. Because of his efforts, a new tree biology based on developments relative to microbial succession, compartmentalization and genetics has emerged.

• "Plants Old and New — An Examination" featuring Robert Bowden, Missouri Botanical Gardens.

• "Developing a Corporate Identification" headed by Alan Hanson, Bellwether Communications.

• "Sales and Contract Techniques for Design/Build" presented by Rick Doesburg, Thornton Landscape Inc.; and Joe Skelton, Lifescapes Inc.

Friday's sessions will close with a 90-minute "Workshop for Solving Tree Problems" showcasing Shigo's expertise on the topic.

Saturday's events are scheduled for the Cervantes Convention Center. Seminars include:

• "Large Tree Transplanting and Moving" with Tom Kessler, Otto Damgaard Sons Inc.; Kip Lankenau, Lankenau-Damgaard & Associates Inc.

• "Discipline Works Wonders" presented by Phyllis Jackson and Greg Pacini, human resource specialists in the education department at the Jewish Hospital of St. Louis.

• "Creative Landscape Designs for the '90s" featuring Ken Miller, president, Horticultural Consultants. Miller formed his firm in 1982 and offers services in

specialty design, plant research, landscape management and professional landscape training. The firm has reached more than 9,000 professional and amateur gardeners, property managers, owners and designers.

• "Concrete Paving and Installation Details" presented by Jim Bowman, Bowman Construction Co.

"Grounds Management Over the Next 10 Years" with speakers John Michalko, Case Western Reserve University; Jeff Bourne, Howard County Parks and Recreation; Thomas Smith, Spring Grove Cemetery & Arboretum; and Robert Berry, Lancaster Landscapes Inc.

• "Recruiting and Retaining Issues" by Peggy Simonsen, director, Career Directions Inc., Rolling Meadows, Ill. A human resources development specialist, she consults with organizations to develop human resources programs and provides on-site training for businesses and organizations.

An all-day session will be "A Look at the ALCA Operating

Cost Study" presided over by Frank Ross. The seminar requires preregistration for materials.

Ross, co-founder of Ross-Payne Associates, Barrington, Ill., is certified by the Institute of Management Consultants and listed in *Who's Who in Finance and Industry*. He is respected as an astute construction economist and financial adviser known for his innovative techniques for financial modeling and information system design.

CLOSING SESSION. Sunday's closing session will have Thomas Hoogheem, manager for environmental concerns at Monsanto, speaking on "Environmental Issues of the Future."

Ron Kujawa, ALCA president, said the Green Team conference's strength is the education portion.

"We have a wide appeal in our educational seminars," he said. "We pay a lot of attention to the business, technical, construction and maintenance segments of the industry. There's something there for everybody."

(continued on page 67)

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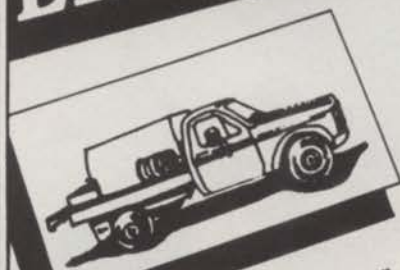
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When Tim Doppel moved up to TURFLON, his bottom line followed.



"The first year we used TURFLON, we realized a \$1,200 savings on service call costs!"—

Tim Doppel, president
Atwood Lawncare, Inc.
Sterling Heights, MI

Keeping a lid on expenses becomes more and more important as your business continues to grow. Do things right, and profits will rise while the cost of servicing each new customer falls. If that's the kind of lawn care firm you want to run, maybe it's time you moved up to TURFLON® herbicide.

When more is less.

"Even though the product costs more, I still end up saving money by using TURFLON," explains Tim Doppel. And he has three years' worth of documented results to prove it pays to broadcast spray TURFLON at about \$9.50 per acre. "The first and foremost advantage of using TURFLON is its effectiveness. It works."

Reducing callbacks and cancellations is the key.

"The first year we used TURFLON, we had a 20 percent reduction in callbacks and that has held steady over the years," Tim says. "We've also seen an increase in customer retention in the three years we've been using TURFLON."

And using TURFLON has one more advantage, Tim adds. It's the reason he's been able to reduce callbacks and cancellations: "My customers are happier."

Isn't it time you moved up to a better herbicide for better weed control? Call us to find out more. 1-800-373-4DOW (4369).

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Water Conservation Concerns Fuel Interest in IA

THE IRRIGATION Association will celebrate 40 years of service Nov. 12-15 at its 10th annual International Irrigation Exposition and Technical Conference, Anaheim, Calif.

More than 300 exhibitors will display their wares for an expected 4,000 attendees.

About half of the exhibitors will be from the turf industry, while the other half will be representing irrigation interests in agriculture.

Although not the original focus of the IA, the turf segment of the show has grown rapidly in recent years, said Mark Williams, IA's communications director.

"It has grown dramatically in the last several years," he said. "The association was originally founded for agriculture, but as turf (contractors) became more interested (in irrigation) we began tailoring for that segment."

Concerns about water conservation are fueling the turf industry's interest in irrigation, he added.

In fact, water conservation will be the topic of several educational seminars throughout the four-day show.

For the technical conferences, 15 speakers will be addressing topics from management to the latest developments in turf and lawn irrigation.

SHORT COURSES. Four special short courses will be held Saturday and Sunday prior to the exposition's opening. These are designed to improve professional expertise and contribute to the preparation for IA certification programs.

The sessions, which will be held in the Anaheim Marriott, include:

- "Landscape Contracting and Installation" covering trends and practices along with troubleshooting in the areas of electrical and hydraulic problems.

- "Designer Preparation" dealing with pressure controls, air vents, pipe sizing strategies, designing for uniformity and other designing tips.

- "Water Management" will cover preparing to perform site inspections, evaluating irrigation systems and developing efficient irrigation systems on a computer.

- "Landscape Irrigation Systems Operation/Maintenance," geared toward parks and recreation superintendents, will include presentations on components and technology, irrigation system design, system maintenance and irrigation scheduling.

The exhibit opens at 4 p.m. Sunday in the Southwest Hall of the convention center and is followed at 8:30 p.m. by a reception for exhibitors at the Marriott.

KEYNOTE ADDRESS. Monday's session begins at 10 a.m. with the keynote address delivered by David Kennedy, director of the California Department of Water Resources. Kennedy has been at his current post since 1983. Before that he was general manager of the Metropolitan Water District in southern California. In the 1960s he was an engineer with the Department of Water Resources.

The California Department of Water Resources will present two days of technical sessions covering recent developments in turf and landscape irrigation.

Monday's session, moderated by the DWR's Marsha Prillwitz, will concentrate on the tools available for surviving dry times. Information about the water management program, xeriscaping, residential water audits and landscape ordinances will be included in the presentation.

Speakers will include Gary Kah, president, Agtech Associates Inc. and a Green Industry Council representative.

Topics and speakers for Tuesday's session include: "Xeriscape and the Irrigation Industry" by Bruce Adams, president, National Xeriscape Council Inc.; "Urban Landscape Water Management" with Gary Robinette, a landscape architecture director;

"CADD Design of Landscape Irrigation Systems" and "Landscape Irrigation with Effluent Water" presented by Stephen Smith and Robert Beccard of Aqua Engineering; and "Water Saving Micro-Irrigation Solutions for Urban Landscapes" delivered by Bob Galbreath, owner, Drip Irrigation Specialties.

MANAGEMENT SEMINARS.

Two comprehensive management seminars are scheduled for Tuesday and Wednesday. The first will have Robert Franciose, manager of marketing for development of wholesale services industry at IBM, discussing "Using Technology to Gain Competitive Advantage" and Ingrid Gudenas, president, Applied Scholastics Inc., covering "Communicating Effectively Under Stress."

The second management seminar will feature Bruce Merrifield, Merrifield Consulting Group, discussing "Marketing Strategies for a Glut Economy" and "Making Perfect Service Happen."

AUCTION. The highlight of a 40th birthday party planned for Monday night will be the auction of a rare piece of kaleidoscope art "Irribundance 40" dedicated to irrigation. The artwork colorfully depicts irrigation's finest — from agriculture to landscaping.

The piece was crafted by Betty Tribe, wife of Glenn Tribe, IA's president-elect. Kaleidoscope art consists of a progression of geometric patterns that look the same at any angle, as in a kaleidoscope.

Money raised from the auction of the original and 200 limited signed and numbered prints of Irribundance 40 will go to IA's Water Conservation Development.

A GLIMPSE INSIDE IA:

What: Irrigation Association's 1989 International Irrigation Exposition and Technical Conference.

When: Sunday Nov. 12 to Wednesday Nov. 15.

Where: Convention Center, Anaheim, Calif.

Exhibitors: More than 300 expected.

Next year's show: Phoenix, Ariz.



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A FUNDAMENTAL principle in urban pest control is the need to apply pesticides to target sites: locations where they will be highly efficacious with no adverse effect on nontarget organisms and the environment.

To accomplish this, chemical and equipment manufacturers have supplied our industry with a wide variety of pesticide formulations and application equipment to satisfy the specialized needs of lawn maintenance and horticultural integrated pest management specialists.

Dusts, granulars, aerosols, emulsifiable concentrates, wettable powders, microencapsulations, etc., are all designed for use under specific environmental conditions, on various substrates (surfaces), directed toward the unique biological and physical features of the target pest, and any specialized requirements the customer may have.

There doesn't seem to be any one perfect formulation that is right for all situations. However, most insect control problems (but certainly not all) can be solved with either a dry or a wet pesticide formulation (Table 1) used as a tool within the context of urban IPM.

With today's modern technology there are many superior wet formulations from which to choose. Historically, though, the most commonly used "wet" formulations are those designed to be dissolved in water (i.e. wettable powders and emulsifiable concentrates). As far as our needs in the urban environment are concerned, water-based formulations are a double-edged sword: their benefits are great, but their deficiencies are often based on the special properties of water.

Because of its unique physical

and chemical properties, water has been called the universal solvent. In the lawn maintenance and horticulture industries, water is an excellent pesticide solvent (or more correctly, a carrier) for several reasons:

1. It's readily available.
2. It's nonflammable and relatively noncorrosive
3. With minimal precautions it will neither evaporate nor freeze during use.
4. It won't add to the toxicity of the active ingredient.

However, many of the attributes that water possesses are also detriments in our business:

1. Its ready availability (especially as rain or in irrigation or sprinkling use) can degrade residual deposits, or remove them from their target site.
2. If not carefully applied, water can translocate active ingredients away to nontarget sites.
3. If subjected to subfreezing conditions, suspended active ingredients may precipitate out, crystallize and damage application equipment or ice crystals may form and damage the equipment.
4. Active ingredients may stratify or settle out unless proper agitation is supplied.
5. If not used in a reasonable time (defined for each active ingredient on the pesticide label), water may split the pesticide molecule (hydrolysis) rendering it useless.
6. The pH (acidity or alkalinity) of the water is suspected to impact the residual life of some active ingredients.

In urban pest management, water is one of the most commonly used tools, and at the same time, one of the most commonly misunderstood. Its features are seldom discussed in any of our training programs, yet its chemistry has a significant impact on the ser-

vice quality, safety and even the economics of our industry.

For these reasons, a basic understanding of the properties of "the universal solvent" are essential to success in this industry. In this article, I can only describe some basic properties of water which directly impact application equipment and application procedures. With an understanding of these properties, the maintenance specialist can protect his assets while providing his customer with a safe, effective and economical service.

Some properties of water that have caused managers great concern in recent years are those contributing to crystallization of active ingredients in spray rigs and freeze damage. But like most business problems, these issues can only be managed when people are trained to recognize their causes. After describing some of the properties of water that may impact these tank freezing and crystallization issues, I will describe specific preventive measures that will allow you to avoid these expensive and dangerous problems.

WATER-BASED INSECTICIDES.

Water is a chemical compound with properties unlike those of any other material. It is the "stuff of life" found in all living organisms, and because of its unusual chemical structure, water has been called the universal solvent. (A solvent is a liquid into which another substance is dissolved, forming a chemical mixture called a solution.)

At standard temperature and barometric pressure, pure water is colorless, tasteless and a poor

Water is a chemical compound with properties unlike those of any other material.

electrical insulator (meaning it readily transmits electricity). Water is also known as a heat "stabilizer" because it absorbs and releases heat very slowly. This phenomenon is best observed in the moderating effect that large bodies of water (lakes, rivers, etc.) have on the climate.

Any fisherman can tell you that lakes gradually warm in the spring (slow to absorb heat) and gradually cool in the autumn (slow to release heat). This physical feature is important to urban pest management specialists; it allows tank mixes to remain relatively stable (no change in state) under fluctuating temperature extremes.

It's a well known fact that water-based systems are more heat stable than organic solvent systems. Evidence to this fact can be found on many aerosol insecticide labels, for instance, requiring their use away from open flames and storage at temperatures below 130 degrees Fahrenheit. Aerosol formulations and oil solutions have many advantages in their own right, but because of their organic solvent and propellant systems, they are much more sensitive to temperature fluctuations than are water-based systems. With minor attention, water based systems are very temperature stable. Without attention, serious problems can occur.

At any given time, water in the urban environment exists in one of three different states or phases of matter: solid, liquid or vapor (Figure 1). Unlike most other compounds, water has the unusual property of expanding when going from the liquid phase into its solid phase (freezing).

In other words, liquid water ex-

posed to temperatures below 32 degrees Fahrenheit (or air movement which causes a wind chill effect of below 32 degrees) will increase in size to such a scale that few solid vessels (plastic, steel, brass and even solid rock) can withstand the pressure. This is an unfortunate situation since urban pest management specialists, in the course of their work, often encounter temperatures and wind chill conditions sufficient to freeze water-based insecticides, or that force the solidified carrier (ice) to separate from the "suspended" active ingredient.

Another interesting property of water which impacts its use as a solvent/carrier for pesticides is its surface tension. Because of its physical structure, water molecules have a strong attraction for one another, such that at its surface the molecules are so tightly bound together that the surface itself is elastic in nature. Like the bed of a trampoline, it stretches and bends and is relatively im-

pervious to puncturing.

Surface tension makes it possible for small insects to glide on the water surface, and is responsible for the fact that many compounds (talcum powder, oil and some pesticides) float on the surface rather than dissolve.

Finally, an important feature of water that directly impacts its utility as a pesticide solvent/carrier is a phenomenon I call the "Small Droplet Effect." Again, because of the physical and chemical make-up of water, less energy is required to bring about a change in phase for a small amount of water (i.e., one drop) than for a large quantity of water (i.e. a standard spray rig). (Figure 2).

For example, a snowflake requires less heat energy to melt (change phase from solid to liquid) than does a block of ice. And conversely, freezing (heat loss) occurs more easily in a small amount of water (such as that left in a coiled hose, a hose fitting or

a nozzle) than in a large tank full of water. I know this sounds very complicated, but this phenomenon must be understood since it has a direct impact on the efficacy of many pesticides and the integrity of your application equipment. All these points will be further defined in the following sections of this article.

INSECTICIDES IN WATER. As previously noted, water can serve as either an insecticide carrier or solvent, dependent upon the chemical features of the formulation chosen. Many pure, technical grade insecticides (active ingredients) are solid, while others are liquid, some are volatile, corrosive, unstable in light or soluble only in organic solvents.

In other words, all active ingredients have their own physical and chemical peculiarities, and must be processed into a form that can be safely, economically and accurately used. As a result, insect-

(continued from on 36).

INSECTICIDE FORMULATIONS

WET

1. Oil Solutions
2. Emulsifiable Concentrates
3. Wettable Powders
4. Microemulsions
5. Aerosols
6. Fumigant Gases

DRY

1. Dust
2. Granulars
3. Baits
4. Solid Fumigants
5. Resin/Plastic Strips

Table 1. For the most part, all pesticide formulations used by lawn maintenance operators fall into one of two categories: wet (liquid) or dry. Formulation choice depends on several factors, including the target pest, application site, available application equipment, cost and safety. This classification is greatly simplified for demonstration purposes only. There is a significant overlap between these various categories, and modern science has developed many other sophisticated formulations that fit specific lawn maintenance control situations.

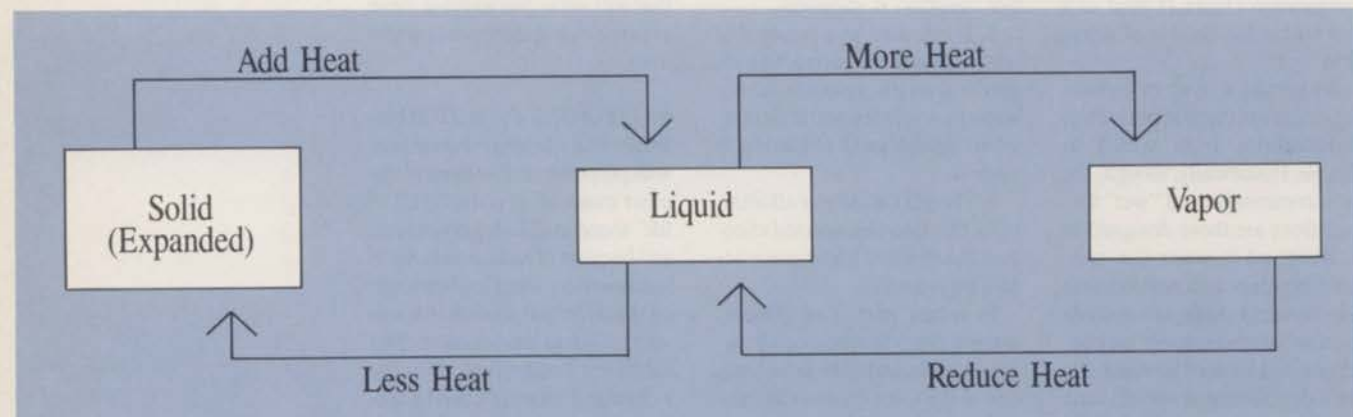


Figure 1. Water can exist in any of three physical states (phases): solid (ice), liquid or vapor. Changes in the state are brought about by the addition or reduction of heat. Lawn maintenance operators use water as a pesticide solvent or carrier inside closed containers (especially expensive spray tanks). Lawn maintenance operators must take special precautions to avoid freezing conditions because water expands with great force with a change in state from liquid to solid. In such instances, the small droplet effect (see Figure 2) must be considered.



40 WONDROUS YEARS OF IRRIGATION



The Irrigation Association

The 1989 International Irrigation Exposition & Technical Conference

Anaheim, California

November 12-15, 1989

In 1989 the Irrigation Association is celebrating 40 years of service to the irrigation industry.

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Technical Conference, Nov. 12-15, at the Anaheim Convention Center. The world's largest show devoted exclusively to irrigation includes:

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Spray Rigs

(continued from page 34)

ticide formulations designed to be mixed in water could fall into one of two broad categories: suspensions or solutions.

As previously noted, water is the universal solvent, meaning it will dissolve more substance varieties than any other solvent known. Unfortunately, water does not readily dissolve any of our commonly used insecticides. It does, however, dissolve (by breaking the surface tension) the emulsifiers and wetting agents that are added allowing the suspension of our insecticides in water.

This is a very important distinction. Our commonly used, water-based insecticides are not true solutions, they are merely suspensions. Wettable powders are nothing more than extremely small dust particles mixed in water, and emulsifiable concentrates are simply minute oil droplets suspended in water. You may ask if this distinction between solution and suspension is really



TEASPOON

Requires little energy (heat) input or removal to change phase.



SPRAY TANK

Requires considerable energy (heat) input or removal to change phase.

Figure 2. Lawn maintenance operators should be mindful that a small quantity of water will evaporate or freeze (change phase) much more easily than a large quantity of water. Why? Because freezing will occur in portions of a spray tank (i.e. hoses, valves, nozzles, etc.) under temperature drops that will have absolutely no effect on the water in the tank itself. Furthermore, the "wind chill effect" may cause freezing in these "small droplet zones" at ambient temperatures above 32° Fahrenheit when unprotected spray tanks are being transported.

important, and the answer is yes. True solutions are uniform in nature and do not settle out.

Suspensions, on the other hand, react quite differently — they may have to be agitated to remain suspended. They can abrade application equipment (hoses, nozzles,

gaskets, etc.), they may not remix if the wetting agent/emulsifier has hydrolyzed and, finally, they may separate (crystallize) from the water carrier if the freezing point of the active ingredient is different from that of the carrier.

This last point becomes ex-

tremely important under conditions of the "small droplet effect" and wind chill, and is very important to the prevention of tank freezing and crystallization of active ingredients during cold seasons.

(continued on page 38)

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Spray Rigs

(continued from page 36)

Furthermore, because of its physical nature, a suspension exhibits a very interesting "freezing" property not experienced with true solutions: seeding. Ice, like other crystals, forms more easily in a cooling liquid medium when particulate matter is present. (Anyone who has ever made rock candy by suspending a string in a saturated solution of sugar water can attest to this fact.)

Particulate matter (minute pieces of active ingredient, dust, dirt or other foreign material) serve as a point of attachment for crystal growth. Once this growth process begins from a "particulate seed," additional crystals can grow using the initial crystal as a substrate or template. In essence, suspended matter can promote crystalline (ice) formation.

As I have already stated, the water-based insecticides we use are suspensions of "seeds," and as such may be able to promote freezing unless preventive measures are taken. An understanding

of this principle (the need to minimize points of attachment for crystals) is essential to solving the problems of tank freezing and crystallization experienced by many urban pest management practitioners.

STRATEGIES TO PREVENT TANK FREEZING. Like any other aspect of running a business, the best way to solve a problem is to prevent it from happening in the first place. Most often, a problem can only be prevented by fully understanding its causes, and taking appropriate actions before the fact. Hopefully, this article has given you more insight into the troubling and expensive problems of tank freezing and crystallization.

Armed with this understanding you can devise your own preventive program for the formulations and application equipment you use in your operation. There are no standardized, textbook solutions to these problems, but many urban IPM specialists have been able to almost completely eliminate these problems from occur-

ring by using the following procedures during freeze season:

- Tanks and spray equipment must be cleaned and repaired on a regular basis (no less than weekly during peak seasons). This eliminates excessive particulate accumulations and leaks (leaks are indicative of unwanted openings and fissures in the system) which provide crystal "seeds."

- Where possible, spray rigs are stored inside when not in use, especially on weekends.

- To overcome the wind chill and small droplet effect, freeze-sensitive spray equipment (hose reels, nozzles, pumps and spray wands) can be shielded within the locked compartments of a utility bed.

- Try to prepare only the amount of emulsion/suspension that can be used on each job. This way, you do not leave any chemical in the tank system at the end of the day to freeze or settle out as "ice seeds."

Others have proposed the addition of antifreeze to their tank residues to prevent freezing. Because of the cost of antifreeze and

the possible contaminating effect it may have on your next application, I can't recommend this as a viable solution.

Furthermore, this approach is not a real solution to the problem — it smacks of lethargy and masks the real solution which is to "take care of your equipment." Other techniques that you may need to employ in your specific operation include the use of truck-mounted heaters (available at most recreational vehicle outlets or automotive parts stores) to be placed inside a camper shell, electrical heat tapes to wrap around the pump and other sensitive application equipment, quick release brackets (i.e., installed on the hose reel and pump brackets) and quick hose disconnects installed at several locations throughout the system (i.e., between the pump and hose reel, not just at the hose ends).

This last point is a subtle one that could pay big dividends in your preventive maintenance program. The ability to easily dismantle equipment into manage-

(continued on page 67)

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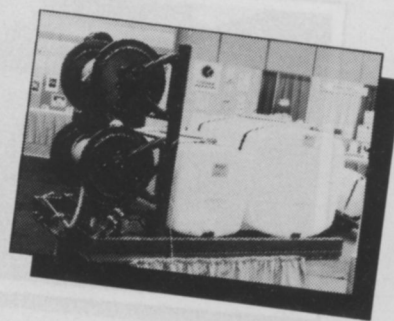
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Presents. . . .
**AN AWARD
FOR PROFESSIONALISM**

Mail in Nominations by Dec. 31, 1989

In our continued effort to promote professionalism, be involved in community awareness and help our industry create a positive public image, *Lawn and Landscape Maintenance* magazine is sponsoring its 4th Annual Award for Professionalism. The winner will be presented a plaque with the company's name and location inscribed on it, and camera-ready art indicating they were chosen to receive an Award for Professionalism suitable for reproduction in advertisements, brochures and letterheads. In addition, a brief article about the company and the award will be sent to the winner's local newspapers. *Lawn & Landscape Maintenance* will also write a feature article on the winner in a future issue.

Previous winners include Atwood LawnCare, Sterling Heights, Mich.;
Greenlon Lawn Care Services, Cincinnati, Ohio;
and J & D Landscape Contractors, Newton, Mass.

If you know of a lawn or landscape maintenance company that deserves to be recognized for efforts in operating a professional business and its operation is respected in the community and by its peers, then why not nominate the business for *Lawn & Landscape Maintenance's* Award for Professionalism?

To nominate a company, read over the ballot on the following page. If you work for, or know of, a company that meets most of the criteria, then nominate your choice by completing this form and returning it to us. All information must be verifiable and nominations must be received no later than Dec. 31, 1989 to be eligible. A company need not meet all criteria to win. The winner of the contest will be announced in the March issue of *Lawn & Landscape Maintenance* magazine.

I am nominating: Name _____
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for *Lawn & Landscape Maintenance's* Award for Professionalism because I think this company fulfills most of your criteria for nomination.

CRITERIA:

1. Supports the local community in the following way(s):
 _____ sponsors youth sports program
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 _____ other (please explain) _____

2. Belongs to a trade association. (If so, please name them.)
 _____ local _____ state _____ national
3. Has the following employee benefit programs:
 _____ insurance plan
 _____ paid vacation
 _____ savings or retirement plan
 _____ company-funded education plan
 _____ incentive program
 _____ other (please explain) _____

4. Is supportive of, and involved with, industry problems at the:
 _____ local level
 _____ state level
 _____ national level
 (Explain) _____

5. _____ Monitors customer satisfaction with some form of "quality assurance" system.
6. _____ Equipment is kept clean and in good operating condition.
7. _____ Safety shields and/or guards recommended by the manufacturer are still in place.
8. _____ Employees are informed of and educated on potential hazards associated with the use of all equipment and materials being handled.
9. _____ Has instituted a comprehensive training program for employees.
10. _____ Chemicals that would constitute a hazardous waste are being disposed of in accordance with local and/or federal regulations.
11. _____ Lawn care chemicals are being used according to manufacturer's recommendations.
12. _____ Trees, ornamentals, sod and seed are being used in locations specified by growers, and are installed according to their recommendations.
13. _____ Company's place of business is kept neat, clean and well-maintained.

14. Additional comments if any: _____

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Packaging, Disposal Innovations Track Pesticide Use

THE PACKAGING OF pesticides has become more user-friendly to the commercial applicator in recent years. But it's just the beginning. Characteristics of present and future packaging will benefit end-users with the means to handle, measure and monitor pesticides.

Consumer household products provide the commercial industry with an indication of the marketability and acceptance of creative packaging. Just like the consumer market, our industry has special needs and should therefore be especially receptive to innovations in pesticide packaging.

The use of a pesticide requires that the packaging provides the user with convenience, product stewardship and, ultimately, container disposal in a manner which allows "cradle to grave" tracking.

User preference for types of packaging will vary, based on the area of greatest concern with a particular product. With some pesticides, for example, the foremost concern is with handling and mixing properties. For other products, container disposal is of greater concern.

Whatever the case may be, for-

mulators and manufacturers have both recognized primary concerns for specific products, and are concentrating their efforts to adjust to these industry needs.

As pesticide users, however, we must realize that manufacturers and formulators are limited to the type of formulation available for a specific product. Even though we may prefer a different formulation for handling purposes or other reasons, the chemistry and resulting effectiveness of the product dictate whether it is available in granular, wettable powder or liquid form.

Creative packaging, however, may compensate for a formulation which is otherwise difficult to handle. For example, water-soluble packaging is an inventive and effective method of handling products which are dusty and difficult for the applicator to measure.

It's important for end-users to identify priorities of concern with a particular product and its formulations. The manufacturers and formulators must determine if these concerns are resolvable. If so, how can changes be economically implemented? Some

changes may be cost-effective for the manufacturer or formulator, yet end-users must also be willing to absorb costs in order to receive the benefits of new formulations.

The level of concern shifts during the "cradle to grave" concept of a pesticide; however, it can be segmented into different stages:

- Accountability and Inventory.
- Handling Characteristics and Exposure.
- Transportation.
- Proper Regulatory Information and Labeling.
- Container Disposal.

ACCOUNTABILITY AND INVENTORY. Certain states have reporting requirements for quantities of pesticides used in a specific time frame. Thus, specific packaging sizes can ease the reporting process.

It can sometimes be difficult to determine exact usage of liquid pesticides, particularly those in large drum quantities. Many companies have resorted to calibrated measuring sticks or metered pumps to establish the product usage.

CONTAINER DISPOSAL OPTIONS AFTER RINSING

Container Type	On-Site Disposal					
	Burn	Bury	Landfill	Recycle	Recondition	Incinerate
Plastic Jug	Yes ¹	No ¹	Yes	Yes ²	Yes ²	Yes
Metal Pail	No	No ¹	Yes	Yes	Yes ²	No
Plastic Pail	Yes ¹	No ¹	Yes	Yes	Yes ²	Yes
Plastic Drum	Yes ¹	No ¹	Yes	Yes ²	Yes	Yes
Metal Drum	No	No ¹	Yes	Yes	Yes	No
Paper/Plastic Bag	Yes ¹	No ¹	Yes	No	No	Yes

LEGEND: Yes — recommended, No — not recommended, ¹ — allowed by federal law only if approved by state and local authorities, ² — allowed by federal law but may not be practical for technical or economic reasons.



national agricultural chemicals association

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As pesticide packaging becomes more user-friendly, associations like the National Agricultural Chemicals Association and others as well as a variety of manufacturers and formulators are developing methods for better labeling, handling, use and disposal of pesticides. The industry has recognized that proper pesticide handling and use must coincide with the primary concerns of specific pesticides and continues to make improvements as technology permits.

While sight gauge systems may be impractical for one-way drums, it may be cost-effective to implement such a system on drums which are returnable for recycling purposes. With the increased use of poly drums, a sight gauge may be potentially molded directly into the container. Alternatively, a see-through level indicator could be made available on drums.

HANDLING CHARACTERISTICS AND EXPOSURE. The foremost concern of pesticide packaging is the dispensing or mixing of the concentrated pesticide to the delivery system.

Manufacturers and formulators

recognize the importance of both the accurate measuring of the product and the need to minimize exposure to the applicator. As a result, they're developing effective packaging in accordance with both needs. Several have adapted their packaging for a given formulation and handling characteristic.

A recent innovation has been the packaging of wettable powders into packets which dissolve when dispensed into the tank. Water-soluble packaging offers exact inventory control, measuring accuracy and minimal applicator exposure.

This type of packaging will in-

crease in use, and will benefit from certain newer pesticides with chemistries that have higher modes of activity and ultra-low rates. It is essential that ultra-low rate products be measured accurately. The capsule or blister packaging compliments the pre-measured accuracy.

Typically, wettable powders have presented the most difficulty in measuring and handling. Certain wettable powder formulations have been packaged as a flowable product to reduce the dust and exposure to the appli-

**EMPTY
CONTAINER
DISPOSAL**
*Safe practices
for agricultural
chemical users*

cator. They are also measured more easily than dry powders. The soluble packets and flowable wettable powders have extra costs to the end-users; however, the benefits prove worthwhile.

Liquid pesticides are becoming more commonly packaged in plastic drums. While this change is probably due to disposal problems, the handling characteristics of these containers have also been improved as a result. Smaller containers are often formed with wider pouring spouts designed to provide easier dispensing than the metal containers which were previously used.

TRANSPORTATION. Traditionally, pesticide packaging has been designed with the warehouse in mind. However, with increasing trends of custom application, integrated pest management and see-and-spray programs, transportation of pesticides by applicators on trucks is becoming more common.

Many formulators have packaged granular formulations with the recognition that they will be subjected to transportation on service vehicles. Granular products packaged in cellophane or aluminum lining reduce the dust and damage associated with moisture or wetness.

Because many companies carry bagging materials on trucks for application to home lawns, a spout or chute could be developed to dispense bags into spreaders. This would be of benefit for bags which have been ripped or torn. The spout could also be interchanged from bag to bag for cost-effectiveness.

The liquid formulations present the biggest transportation problem, since they often must be decanted into smaller containers for service trucks. The "tip-and-pour" containers which provide storage and self-contained measurement are frequently used for this purpose.

The federal Department of Transportation requires that specified information (product name, address of manufacturer, signal word, EPA registration, name and address of the end-user) be transferred from the original container to the one on board.

Preprinted labels with blank spaces for company name and address (or sample labels for photocopying) could be produced



Applicators have begun to recognize the potential liability resulting from improperly disposed containers. Photo courtesy NACA.

ed by the supplier for the benefit of the end-user. Placed on the smaller containers, these would ensure compliance with DOT regulations. Identification stickers or tags could also be supplied in pesticide packages for use on hand cans and backpack sprayers.

REGULATORY INFORMATION AND LABELING. The container specifications for the packaging of pesticides are mandated by the federal DOT. Packaging must fulfill requirements of the Code of Federal Regulations (CFR 49). Additionally, the proper shipping papers (bills of lading) and Material Safety Data Sheets are required to provide the transporter with the necessary information regarding the product in the event of emergency response.

The person in charge of receiving shipments should become familiar with the documents and package markings which identify the pesticide during shipping. The two most important forms of identification are the common name

and DOT identification marking.

The shipping documents and packaging will often be stamped or labeled with these DOT identification markings. Two common examples of these markings would be NA 2765 and ORM-A. These package markings provide identification for emergency response teams in case of a spill or discharge of the product.

From time to time, a shipment may be received in damaged condition. In such an event, the common carrier should be contacted immediately. Though a company may be understandably reluctant to receive a leaking drum, the DOT requires that they accept it, so supplies necessary to receive a damaged shipment should be kept on dock. A 55-gallon "over-pak" or salvage drum oversized to hold a damaged drum is an essential item to have in the loading dock area.

In many minds, the label on the pesticide package is the component which is in need of revision. The applicator has historically viewed this document for instruc-

tion and information, a resource for the best way to apply the pesticide and to avoid any repercussions from its application.

From this viewpoint, the label serves the trained applicator well. In the future, however, labels may become cluttered with additional or amended instructions. When read by someone unfamiliar with the information, labels may lead to inaccurate interpretations or create questions regarding the product and its use.

Ultimately, pesticides may be accompanied by split labels, with sections targeted at the information requested by users and various public groups.

CONTAINER DISPOSAL. Container disposal has become an increasing problem because of many factors, including hazardous waste generation laws and acceptance of used containers by waste haulers and sanitary landfills. Applicators have also begun to recognize the potential liability resulting from improperly disposed containers.

Granular and wettable powder formulations packaged in corrugated cardboard, paper and plastic bags have presented minimal problems for disposal. The pesticide container disposal problem is typically oriented to liquid formulations. Many suppliers have initiated returnable drum programs for recycling plastic pails and drums to be refilled with the same product.

Prior to either recycling or reconditioning, the drums must be properly rinsed and prepared according to state and federal laws and the conditions of the vendor receiving the drum. For drums with removable heads, manufacturers can assist in recycling by placing a plastic liner inside the drum if possible.

Pesticide packaging has undergone great advances in recent years. These changes have vastly improved convenience of storage, transportation and use, while minimizing exposure to the applicator. It is expected that manufacturers and formulators will continue to produce innovative products and packaging in response to industry needs. — Gary Clayton

The author is vice president of operations for Perma-Green, Boise, Idaho.

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Have Dethatching Tools Taken a Back Seat to Aerators?

AMONG THE VARIETY of available landscape tools, the power rake, or dethatcher, doesn't stand out with any special glamour.

Though the power rake has been in existence a good number of years, it has not, from the day of its inception, gone through any major design changes and it's not likely to be used on any single property more than once a year.

The main purpose of a power rake is to remove thatch, which is composed of intermingled layers of living and dead stems, stolons, rhizomes and roots between the green vegetation and the soil surface. A thin layer of thatch is normal, even healthy, since it retains some moisture in the soil

and increases wear tolerance. But a half-inch layer or more of thatch blocks air, light and water from reaching root zones.

Thick thatch isn't necessarily a result of neglect. In fact, it's often the well-kept lawn that suffers the most — as fast-growing turf

produces more thatch.

What harm can thatch do? In addition to starving a lawn by preventing water and fertilizer from seeping down to the turf's root zone, thatch can also suffocate a lawn by preventing oxygen from reaching the roots and causing grass to take root closer to the surface, even in the thatch itself. And, thatch can also become a breeding ground for harmful insects and disease organisms.

EQUIPMENT DIFFERENCES.

Some power rakes operate with a recoil spring on a reel, others with a solid bar that flails the

ground and others with a vertical knife for slicing, typically on fine lawns.

Catherine Duckworth, secretary/treasurer, Tine Rake Co., Rayton, Mo., said that what is important in power rake usage is the adjustment of the tines, or the tiny prongs "that work like fingers back and forth digging out the thatch. If they just touch the top of the grass they don't reach the thatch, but if they're too heavy they go too deep and tear out the grass."

Power rakes can be either walking equipment for tight areas or riding equipment for open spaces. "Both back and front mounts are available," Duckworth said. "If it's in the back you'll have to go over the lawn again with a sweeper. But if it's in the front, it can dethatch, mow and bag all at once."

Robert Brophy, manager/lawn care product sales for Cushman, Lincoln, Neb., said, "the greatest improvement in dethatchers over the past two to three years has been the addition of seed boxes to implement overseeding and verticuting at the same time."

He added that the primary difference in dethatchers is whether the blades rotate clockwise or counterclockwise. "It's the counter-rotating or upmilling blades which do the better quality job," he said.

Over the years there have been minor developments in terms of the introduction of different drive trains, types of blades and handles.

"Power rakes were introduced about 25 years ago, but, in terms of the real business end, that portion of the rake that actually digs the thatch out of the ground, they haven't changed that much," said Jerry Jones, president, E-Z Rake Inc., Lebanon, Ind.



With few exceptions, the company's first power rakes, manufactured in 1962, have changed little.

Jones sees power raking as analogous to vacuuming. "A lot of people believe you don't need to pick up grass to have a beautiful lawn. When my father-in-law started vacuuming, everybody looked at him as if he had a screw loose. 'Why pick up grass?' they asked. Needless to say, vacuuming has become important. It's the same with dethatching."

.....
Power rakes can be either walking equipment for tight areas or riding equipment for open spaces.



Thatch removal permits better lawn aeration and irrigation. Easy Rake has preset height adjustments (far left). A front-mounted dethatcher from Tine Rake (top left). A variety of tine styles from Ryan (top right). The results of a Tine Rake dethatcher picked up by a sweeper (above).



POWERRAKE SALES. Jones said that 90 percent of the dethatching business is done through homeowners renting equipment through rental supply houses. Because power rakes generally cost from \$500 to \$1,000, it's not the type of implement a homeowner would need to buy for a once-a-year project.

The commercial landscaper, however, represents a relatively new aspect of this market. "We're seeing an increase in the commercial market, though not as much

as we would like," Jones said.

Duckworth said the commercial market has been a gradual, hard-to-sell market, though last year was Tine Rake's best year.

Brophy, on the other hand, said that power rake sales "have been relatively stable for the past few years, but is now beginning to fall off." The reason, he explained is, "dethatching is labor intensive and most people are turning to aeration, which takes away the need to pick up the thatch. So the total dethatching market is declin-

ing while the aeration market is increasing."

Brophy explained that if a yard has more than one-half inch of thatch, dethatching is necessary, but adds that regular aeration can prevent the thatch from building up to unacceptable levels.

Aeration is the naturally occurring process of air exchange between the soil and its surrounding atmosphere. More specifically, core aeration is the process of mechanically removing small plugs of thatch and soil from the

lawn to improve soil aeration.

Brophy said core aeration benefits the lawn in three important ways. It breaks through dense thatch and opens up the soil to permit free movement of water, fertilizer and air. By extracting cores from every square foot of the lawn, it relieves soil compaction and gives grass roots room to grow. And it breaks down and integrates into the thatch to speed up its decomposition.

The type of aeration equipment used influences the benefits obtained from the aeration. Equipment with hollow tines remove soil cores. Equipment with open tines divot the soil surface. Aeration equipment varies in tine size, generally up to 3/4-inch and in depth of penetration. Penetration depth depends on soil type, moisture, tine diameter and the weight and power of the aerator. For example, tines penetrate sandy soils easier than heavy clay soils, and penetration is better in moist soils than dry ones.

Robert Shearman, turfgrass professor at the University of Nebraska makes the following observations about core aeration:

In general, turf responds best when core holes are close and deep. A 3/4-inch aeration tine with 6-inch spacing and a penetrating depth of 3 inches removes about 1.2 percent of the soil's volume in that 3-inch profile. The same time spaced 2 inches apart removes about 10 percent of the soil in the same 3-inch profile.

The closer tine placement removes more soil, exposes more soil surface area for water and fertilizer uptake and alleviates compaction quicker than the wider tine spacing. Immediately after aeration, the lawn will be dotted with these small plugs pulled from the soil. Within a week or so these plugs or thatch and soil break apart and disappear into the lawn.

Because dethatching puts stress on the lawn, it usually is best done once a year in the fall. In many cases, however, aeration can be performed beneficially twice a year.

Both spring and fall are good times to aerate cool-season turfgrass such as Kentucky bluegrass and perennial ryegrass. Aeration before or at the time of late season fertilization enhances root growth responses and improves spring green-up and growth.



The Ryan Ren-O-Thin in use.

It is best to aerate warm-season turfgrasses such as zoysiagrass and bermudagrass in midspring to summer. Avoid aerating when warm-season grasses are dormant. This may encourage cool-season weed competition. In addition, avoid aerating warm-season grasses during spring green-up. It is best not to aerate warm-season lawns until after they have received their first mowing in the spring.

Although aeration is beneficial for lawns, it can also open up spaces for weeds such as crabgrass and annual bluegrass to invade the lawn. Although it was once thought best to aerate before applying preemergence herbicides, rather than after, recent studies have shown that spring aeration doesn't result in serious reduction in chemical performance.

Applying fertilizer after aeration helps the lawn compete against weeds. Water the lawn after aeration, particularly in

market hasn't gotten to that point yet," he said. "For thatch control we're still at the level of catching the clippings with a bag."

Adsit said the few times he's had a real need for either dethatching or aerating he's subcontracted the work out to someone else. "I think as this market matures, we'll see more of this type of lawn care," he said. "Dethatching and aeration are like seasonal color bulbs. Five years ago they were a luxury. Now they're a necessity."

Eric Keesen, president, Allen Keesen Landscape Inc., San Antonio, Texas, pointed out that since aeration machines run from \$1,500 to \$3,500, as opposed to \$500 to \$1,000 for power rakes, aeration may never completely replace dethatching.

On the other hand, he personally uses neither. "We scalp or super-cut close to the ground to remove the thatch, then go in with a verticutter to get the rest," he said. "Scalping seems to act as

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As the industry continues to grow and become more sophisticated, it appears that an increasing number of contractors will find a use for both machines.

areas where drought and high temperatures are common.

CONTRACTOR PREFERENCES. Depending on the area of the country, landscape contractors hold differing opinions on the use of dethatchers and aerators.

For Russell Adsit, president, Adsit Landscape & Design Firm, Memphis, Tenn., neither pieces of equipment are an issue. "We don't feel the need for them, for the maturity of the Memphis

a vacuum cleaner for the thatch, then verticutting drives the rest into the soil. Verticutter blades cut about an inch down into the soil and can be adjusted to go down about 1 1/2 inches; so it is a form of aeration. You can get a good power-driven verticutter for about \$3,000."

When asked whether he felt his methods compromise the quality of the lawn, he replied, "No, what we do accomplishes the same thing as dethatching and

aeration, maybe not to the same degree, but enough for our purposes. We do it every year so we're able to get enough thatch out, and use it in conjunction with overseeding in the fall."

Mark Gemmer, operations manager, Tecza Brothers Inc., Elgin, Ill., said, "If you come across a new client with a severe thatch problem, then you have no choice but to dethatch. However, 95 percent of our clientele have been with us for a long time. So our lawns are never at the point where the boundary line is overstepped and dethatching is needed rather than aeration."

Gemmer added that aeration "provides the soil with air and nutrients so the grass can thrive better, as well as removes the thatch, where as power raking only removes the thatch."

Donald Croson, president, Accent Landscaping, Winfield, Ill., said he believes aeration and dethatching can compliment each other. "In the process of aeration, you end up with plugs remaining on top of the turf area," he said. "A power rake following will burst those little plugs, thus disposing of them while getting rid of the excess thatch."

Tom Mann, president, The Caretakers, Inc., Eagan, Minn., also said aeration and dethatching compliment each other and feels there is a need for both. "Power raking is the cure after you get the disease, while aeration is the shot you take before you get the disease," he said. "Aeration can prolong the intervals between dethatching, but in our area there is still definitely a need for dethatching."

Mann aerates twice a year, then dethatches every two to five years. "We're as pleased as could be with our power rake, except for the fact that it spends much of its time sitting in the shop," he said. "What we have done, however, is incorporate our pull-behind unit so that the dethatching knife can be replaced with a flailing knife, extending the use of the equipment."

As the industry continues to grow and become more sophisticated, it appears that an increasing number of contractors will find a use for both machines. —
Michael Major

The author is a free-lance writer based in Port Townsend, Wash.



*Here, nature's constantly
pulling out all the stops to
make life difficult. In this
neighborhood, turf doesn't
survive on good looks
alone. What makes you
think you can handle a turf
test this tough?*


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Mediocre Growing Conditions Accentuate Need for Fertilization

THE NEED FOR SUPPLEMENTAL care of landscape trees and shrubs becomes evident when we consider the growing conditions these plants are faced with.

Subsoil is the all too common growing medium and even that is usually compacted. Other problems include poor drainage, restricted root zone area, air pollution, deicing salts, competition from turfgrass for water and nutrients and poor soil fertility. Fertilization is not a panacea, but is one of the most important tools available for maintaining healthy landscape plants.

Forest trees are perceived to thrive without the addition of fertilizer (not necessarily true), which can give the erroneous impression that trees do not require fertilizer. Forest soils are rich in humus which is replenished by the decay of plant residues.

Leaves are relatively high in accumulated nutrients, and their decomposition is an important source of returning nutrients to

soil elements which were absorbed and used in the formation of plant tissues are not returned to the soil and should be replaced with supplemental fertilization.

Benefits of fertilization include:

- better resistance to insect and disease pests,
- improved plant appearance,
- increased growth, and
- improved tolerance of stressful growing conditions such as drought.

Most arborists fertilize all trees and shrubs with a complete fertilizer containing nitrogen, phosphorus and potassium. Since arborists are concerned with the health of trees and shrubs growing in a wide variety of soil conditions, the most practical approach is to provide an effective fertilizer formulation that satisfies the needs of most plants rather than tailoring a fertilizer program for each individual plant.

Specific soil or plant deficiencies, such as extremely acidic or alkaline soil or the unavailability of micronutrients, can be addressed on an individual basis.

RATE AND FORMULATION.

Research has shown that a fertilizer ratio of 3:1:1, such as a 30-10-10 analysis, produces the best growth response for trees and shrubs.

This ratio indicates the relative importance of nitrogen over phosphorus and potassium for stimulating plant growth. What the ratio doesn't tell you is the rate or type of nitrogen that should be used for tree and shrub fertilization. Don't assume that every fertilizer with a 3:1:1 ratio is the same.

Nitrogen should be applied at the rate of three pounds per 1,000 square feet of root area per year or six pounds every other year. For stressed, declining or generally unhealthy trees and shrubs, use

a rate of five to six pounds per 1,000 square feet per year until plant growth and appearance improve.

Consider using half of these amounts for fertilizer-sensitive plants and broadleaf evergreens if using a quick-release fertilizer or, instead, use a slow-release, low-burn fertilizer at full rate.

The amount of fertilizer to be applied per 1,000 square feet of root area can be calculated by dividing the nitrogen analysis into the desired nitrogen per 1,000 square feet. For example, to determine the amount of 30-10-10 fertilizer required to apply six pounds of nitrogen per 1,000 feet, divide six by 0.30, which equals 20 pounds.

There aren't many fertilizers available that can safely apply the previously indicated rates without causing the plant injury. A fertilizer's salt index and water-insoluble nitrogen (WIN) content are the best indicators of fertilizer quality and safety. The salt index is an indicator of the burn potential of a fertilizer. The lower the salt index, the lower the burn potential.

The percentage of WIN determines nitrogen residual in the soil. The higher the percent WIN, the longer the nitrogen remains in the soil. Ureaformaldehyde nitrogen sources offer the desired combination of low-burn and slow-release properties.

APPLICATION TIMING. Although the roots of woody plants may elongate throughout the growing season, active root growth most often occurs in early spring and late fall when soil temperatures are relatively cool and there is little competition from leaves for water and nutrients.

Fertilization is most effective when supplemental nutrients are

available during these periods of optimum root growth. Soluble nitrogen fertilizers, because of their short residual in soils, should be applied between October and December and/or between February and April.

Slow-release nitrogen ensures availability in the root zone for a relatively long period, depending upon the solubility of the nitrogen source. The application timing of these fertilizers may not be a major concern.

APPLICATION TECHNIQUES.

Fertilizer for trees and shrubs basically involves either a surface or a subsurface application.

Surface application. Nitrogen fertilizers can be applied to the soil surface because nitrates are highly mobile in soil solution and will move downward in the root zone. This method of fertilization is still frequently recommended despite the fact that it's based upon university research under nursery conditions.

This technique is not recommended for those practicing commercial fertilization under landscape conditions. Turfgrass within the application zone may be injured or respond with undesirable succulent growth.

Also, surface applications of phosphorus provide no benefit to the tree or shrub because phosphorus is bound tightly to soil particles and doesn't move downward to contact the absorbing roots. If you decide to use this method, apply no more than three pounds of nitrogen per 1,000 square feet from a slow-release source.

Drill hole. Fertilizer can be placed in the root zone by drilling holes in the ground and dividing the recommended amount of fertilizer equally among the holes. For trees, the holes should be drilled in a grid pattern 12

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Most arborists fertilize all trees and shrubs with a complete fertilizer.

the soil. Organic matter increases the retention and availability of most plant nutrients and improves the soil structure by "cementing" or aggregating soil particles.

In contrast, urban soils are usually very low in humus and fertility. Leaves and other debris are removed, thus interrupting nature's recycling program for nutrients and preventing the accumulation of organic matter. The

inches deep and 18 to 24 inches apart using a two-inch diameter drill bit or auger. Begin two to three feet from the trunk and extend two to three feet beyond the drip line.

To prevent turfgrass injury the fertilizer level should be at least four inches below the soil surface. The holes can be left open or filled with sand, pea gravel or perlite. In quality lawns, a plug of grass can be removed before drilling and replaced after adding fertilizer.

Soil Injection. Liquid soil injection is a fast, economical alternative to the drill hole technique for applying nutrients within the root zone.

The injection equipment consists of a hydraulic sprayer operated at 150 to 200 psi and an injector probe that inserts about 12 inches into the soil. The injections are normally in a grid pattern about three feet apart within and slightly beyond the drip zone. The nutrients are distributed throughout the root zone, providing maximum root contact while aerating the soil.

Oxygen is necessary for root growth and is often limited in compacted urban soils. Soil injection helps alleviate compaction and improves oxygen penetration into the root zone.

Soil injection provides more thorough nutrient distribution than the vertical hole technique and generally can be done in about one-fourth the time. Either a soluble or suspension fertilizer, or a combination of the two, is necessary for this method. Unfortunately, many soluble fertilizers have a relatively high burn potential and soluble nitrogen may be leached from the root zone before it is used.

Soluble methylol and methylene ureas have a lower burn po-



Liquid soil injection is a fast, economical alternative to the drill hole technique. Photo: The Davey Tree Expert Co.

tential than urea or other soluble nitrogen sources, but will last for only about six to nine weeks in the soil.

Because of limitations of liquid soluble fertilizers, suspension fertilizers are the best choice for soil injection use. Suspended in water, powdered ureaformaldehyde can be injected into the soil and dispersed laterally by hydraulic pressure. At least 60 percent of the total nitrogen in these sources is water-insoluble nitrogen and becomes available over a one- to two-year period.

Since the nitrogen salts are released gradually as the compounds degrade, suspension-type ureaformaldehydes have a significantly lower burn potential than soluble nitrogen sources and can safely supply the recommended annual rate of three to six pounds of nitrogen per 1,000 square feet in a single application.

Other methods of nitrogen, phosphorus and potassium fertilization such as spikes driven into the ground, trunk injections or foliar sprays are of minimal value because inadequate amounts of

nutrients are supplied.

The type of fertilizer and application technique that you choose should reflect the quality of service that your customers pay for and expect. Soil injection of a complete fertilizer with a high WIN content and low salt index is clearly the best choice for maintaining vigorous and beautiful trees and shrubs in today's landscapes. — David Whitworth ■

The author is a horticulturist with The Davey Tree Expert Co., Kent, Ohio.

Winter Weed Control In Warm-Season Turfgrasses

UNLIKE AN ANNUAL crop, such as most vegetables, turfgrasses are subject to weed infestations during the entire year. As a result, turfgrass managers learn early that a healthy, actively growing dense stand of turfgrass is the first line of defense against weed infestations.

Good weed control comes with education. Warm-season turfgrasses such as bermudagrass, centipedegrass, St. Augustinegrass and zoysiagrass enter a state of suspended growth called dormancy during the winter months. As growth slows with the onset of cool fall temperatures, warm-season turfgrasses become less competitive with weeds.

It's during this slow-growth period—late summer to early fall—that a group of plants called winter annuals exhibit a major period of seed germination. This

peak period of winter annual seed germination coincides with the time that warm-season turfgrass growth is declining. As a result, warm-season turfgrasses are readily infested with a wide variety of winter annual weeds.

After germinating, winter annuals tend to grow slowly during the late fall and early winter months, but initiate rapid growth and development as temperatures warm in the early spring. After the rapid growth period, winter annuals produce seed and die with the onset of high summer temperatures.

Warm-season turfgrasses are dormant during a large portion of the time that winter annuals are present. Aside from the fact that winter annuals are unsightly in dormant turfgrasses, is there a bona fide reason to control winter annual weeds? The answer is definitely yes.

A dense infestation of winter annuals can be extremely damaging to warm-season turfgrasses during spring green-up (transition from winter dormancy to active turfgrass growth). Competition for sunlight, soil moisture, growing space and, perhaps, plant nutrients can be intense during this time period.

Shade produced by winter annual weeds impairs turfgrass photosynthesis at a time that carbohydrate production is needed for rapid spring growth. Additionally, winter annual weeds consume large amounts of the available soil moisture that is needed by warm-season turfgrasses during the spring green-up process.

As dense infestations of winter annual weeds die in the late spring, turfgrass cover may be severely reduced or have large openings that are easily infested

by summer annuals such as crabgrass and goosegrass. Therefore, a failure to control winter annuals usually leads to increased summer weed problems.

Winter weeds may be classified into two categories that are based on their life cycle. Winter annuals complete their life cycle in less than one year and reproduce only by seed. Examples include annual bluegrass, common chickweed, henbit, parsley-piert, lawn burweed and corn speedwell.

Winter perennials live for more than two years and reproduce by seed and underground vegetative structures. Examples include wild garlic and wild onion. Regrowth from underground bulbs is the primary means of reproduction by wild garlic and wild onion in turfgrasses.

PREEMERGENCE WEED CONTROL. In warm-season turf-

Common Name	Trade Name(s)	Formulations ¹	Company
Atrazine	Aatrex Purge II	80W, 90DG, 4L 2L	Ciba-Geigy Security
Benefin	Balan 2.5 Benefin Granular	2.5G, 60DF 2.5G	Elanco LESCO
Benefin + Oryzalin	XL	2G	Elanco
Benefin + Trifluralin	Team	2G	Elanco
Bensulide	Betasan Lescosan Weedgrass Preventer Roysan Bensumec 4LF	2.9E, 4E, 3.6G, 7G, 12.5G 4E, 7G, 12.5G 8.5G 4E, 12.5G 4E	ICI LESCO Scotts Royalgard PBI/Gordon
DCPA	Dacthal Dacthal	75W 5G	SDS Biotech LESCO
Napropamide	Devrinol	50W, 2G	ICI
Oryzalin	Surflan	4AS	Elanco
Oxadiazon	Ronstar	50W, 2G	Rhone-Poulenc
Pendimethalin	Southern Weedgrass Control Turf Weedgrass Control Weedgrass Control PRE-M Pendimethalin	2.45G 1.71G 60DG 60DG 60DG	Scotts Scotts Scotts LESCO Clean Crop
Pronamide	Kerb	50W	Rohm-Haas
Simazine	princep	80W, 90DG, 4L, 4G	Ciba-Geigy

Table 1. Directory of preemergence herbicides that may be used for winter annual weed control in labeled warm-season turfgrasses. ¹W = Wettable powder; DG = Water dispersible granule; L = Liquid; E = Emulsifiable concentrate; G = Granule.



grasses that are not fall-overseeded, numerous herbicides can be used to control winter annuals (Tables 1, 2).

Depending upon the geographical location, late summer to early fall applications of preemergence herbicides will control certain winter annual weeds. Common chickweed, henbit and annual bluegrass are easily controlled with atrazine, benefin, benefin plus oryzalin, oryzalin, pendimethalin and simazine.

Additionally, common chickweed can be controlled with DCPA, napropamide and pronamide. Preemergence herbicides that have effectively controlled parsley-piert are atrazine, bensulide, oxadiazon and simazine. Atrazine, napropamide and simazine are effective for lawn burweed control. Good to excellent corn speedwell control has been obtained with atrazine, benefin, DCPA, napropamide, pendimethalin, oxadiazon, pronamide and simazine.

Of the preemergence herbicides, atrazine and simazine provide the broadest control spectrum of winter annual weeds. Additionally, atrazine and simazine have good postemergence activity on winter annual weeds. Pre-



emergence and postemergence activity enable these herbicides to be applied over a wide time period.

Research conducted in Georgia has shown that atrazine or simazine applied from October through February will control winter annual weeds in bermudagrass. Current label restrictions for atrazine allow applications at 1.0 pound a.i./acre to hybrid bermudagrass from Oct. 1 to April 15. Simazine is labeled for applications from Sept. 1 to June 1 on hybrid bermudagrass at 1.0 pound a.i./acre.

In our work, 1.0 pound a.i./acre

of atrazine or simazine applied in the fall has occasionally failed to control winter annual weeds. However, when the fall application was followed with an additional 1.0 pound a.i./acre application in February, winter annual weeds were effectively controlled. Atrazine and simazine may be used as a split application at 1.0 pound a.i./acre or as a single 2.0 pound a.i./acre application in centipedegrass, St. Augustinegrass or zoysiagrass for winter annual weed control.

Another preemergence herbicide that has postemergence activity on certain winter annuals

is pronamide. Postemergence applications or pronamide will control annual bluegrass, common chickweed and corn speedwell. Pronamide is labeled only for bermudagrass.

POSTEMERGENCE WEED CONTROL. Postemergence herbicides that contain 2,4-D, dicamba, MCPP, MCPA or dichlorprop, or combination products that contain two or more of these herbicides can also be used for winter annual broadleaf weed control.

Similar to preemergence herbicides, postemergence herbicides vary in their effectiveness for winter annual control. For example, at recommended rates, a single application of dicamba will provide excellent control of common chickweed. In contrast, two applications of 2,4-D plus MCPP plus dicamba at recommended rates are required to achieve a level of control similar to dicamba.

The best results with phenoxy- or dicamba-containing herbicides are when applications are made to small, actively growing weeds at temperatures above 60 degrees

Common Name	Trade Name(s)	Formulations ¹	Company
2,4-D	Numerous	Numerous	Numerous
MCPP	Turf Herbicide MCPP	2.0 lbs./gal.	Rhone-Poulenc
	Mecomec 4	4.0 lbs./gal.	PBI/Gordon
	LESCOpx	2.5 lbs./gal.	LESCO
dicamba	Banvel	4.0 lbs./gal.	Sandoz
	Dicamba 4	4.0 lbs./gal.	PBI/Gordon
2,4-D + 2,4-DP	Weedone DPC Amine	1.85 + 1.85 lbs./gal.	Rhone-Poulenc
	Weedone DPC	1.85 + 1.85 lbs./gal.	
2,4-D + dicamba	Eight-One	3.1 + 0.4 lbs./gal.	LESCO
	Phenaban 801	3.0 + 0.4 lbs./gal.	PBI/Gordon
2,4-D + MCPP	LESCOpar	1.0 + 2.0 lbs./gal.	LESCO
	Turf Kleen	1.0 + 1.0 lbs./gal.	Rhone-Poulenc
	Phenomec 2+ 1	1.0 + 2.0 lbs./gal.	PBI/Gordon
2,4-D + MCPP + dicamba	Trimec Classic	2.0 + 1.1 + 0.2 lbs./gal.	PBI/Gordon
	Three-Way	2.4 + 1.3 + 0.2 lbs./gal.	LESCO
2,4-D + MCPP + dichlorprop	Weedestroy Triamine	1.3 + 1.3 + 1.3 lbs./gal.	Riverdale
2,4-D + dichlorprop + dicamba	Super Trimec	2.0 + 2.0 + 0.5 lbs./gal.	PBI/Gordon
imazaquin	Image	1.5 lbs./gal.	LESCO
			American Cyanamid
MCPA + MCPP + dichlorprop	Weedestroy Triamine II	1.3 + 1.3 + 1.3 lbs./gal.	Riverdale
	Sabre	1.3 + 1.3 + 1.3 lbs./gal.	Royalgard
MCPP + 2,4-D + dicamba	Southern Trimec	2.8 + 1.5 + 0.3 lbs./gal.	PBI/Gordon
metribuzin	Sencor 75 Turf	75 WP	Mobay

Table 2. Directory of postemergence herbicides that may be used for winter annual weed control in labeled warm-season turfgrasses. ¹WP = Wetttable powder.

Fahrenheit. Metribuzin, which is chemically related to atrazine and simazine, will control most winter annual broadleaf weeds and annual bluegrass in bermudagrass. When wild garlic/onion is present, herbicides that contain 2,4-D or dicamba will need to be included in the winter weed control program.

Alternatively, imazaquin may be used to control wild garlic/onion in warm-season turfgrasses (except bahiagrass). In addition to wild garlic/onion control, imazaquin has shown good to excellent control of annual bluegrass, common chickweed and parsley-piert in experiments conducted by the authors in Georgia.

TURFGRASS TOLERANCE. The ideal time to control winter annuals with postemergence herbicides is when the warm-season turfgrass is completely dormant. Applications prior to spring green-up will minimize the possibility of temporary turf injury.

Postemergence herbicides such as 2,4-D plus MCPP plus dicamba have been shown to slightly decrease the quality of "Tifway" bermudagrass when applications were made three to four weeks prior to or during the period of active green-up. Although a decrease in quality occurred, the decrease in quality was temporary. In addition, better turf growth occurred in treated than in non-treated turf due to the elimination

of winter annual broadleaf weeds.

Another reason to control winter annuals while warm-season turfgrasses are dormant is that the weeds will be small and better control will be achieved. At the advanced weed growth stages that usually occur in the latter stages of green-up, the effectiveness of most postemergence herbicides decreases.

Similar to phenoxy- and dicamba-containing herbicides, imazaquin can cause slight to moderate delays in green-up if applications are made during the spring transition. As previously discussed, all postemergence herbicide applications should be avoided during the spring transition of warm-season turfgrasses.

The warm-season turfgrass species vary in their tolerance to preemergence and postemergence herbicides. Reduced, or often, only one-half rates of most phenoxy- or dicamba-containing herbicides are approved for use on dormant centipedegrass and St. Augustinegrass. The individual product label should be consulted to determine the rate and any application precautions prior to using any herbicide on a warm-season turfgrass.

FALL OVERSEEDED TURFGRASSES. Weed control in warm-season turfgrasses which are fall overseeded with a cool-season species, such as perennial ryegrass,

differs from non-overseeded situations in that the turfgrass manager must consider the tolerance of the cool-season as well as the warm-season turfgrass to herbicides.

With most preemergence herbicides, three to four months must elapse between the last application and any reseeding efforts. Therefore, preemergence herbicides should not be applied in the fall to areas that are scheduled to be overseeded.

Two herbicides are available that will control annual bluegrass in bermudagrass that is fall-overseeded with perennial ryegrass. Ethofumesate (Prograss) may be used on dormant bermudagrass 15 to 30 days after overseeding for preemergence and early postemergence control of annual bluegrass. Delays in spring green-up can occur if bermudagrass is not completely dormant at the time of the ethofumesate application.

Fenarimol (Rubigan), a commonly used turfgrass fungicide, has preemergence activity on annual bluegrass. Two to three applications, with the last application two weeks prior to overseeding, will control annual bluegrass in bermudagrass that is overseeded with perennial ryegrass.

Broadleaf weeds such as common chickweed and henbit may be controlled with 2,4-D, dicamba, MCPP, MCPA and dichlorprop or mixtures that contain two or more of these herbicides.

Applications should be delayed until the perennial ryegrass has been mowed three to four times. Delaying the application significantly improves the tolerance of perennial ryegrass to postemergence herbicides.

SUMMARY. Winter annual and perennial weeds can be effectively controlled in warm-season turfgrasses.

As the competitive ability of warm-season turfgrasses with weeds decreases during the dormancy period, herbicides will be needed to control winter weeds. The use of a preemergence herbicide in non-overseeded areas combined with supplemental applications of postemergence herbicides will enable the professional turfgrass manager to limit the appearance and harmful effects of winter weeds on warm-season turfgrasses. — Tim Murphy and B.J. Johnson ■

The authors are an extension agronomist/weed science and professor, respectively, at the Extension Agronomy and Agronomy Departments, The University of Georgia, The Georgia Station, Griffin, Georgia. Trade names are used only for information. Mention of a trade name does not imply approval of any product to the exclusion of others which may also be suitable.

One bad Fall Could change a Child's whole Life

Young athletes need your help

Let's look at reality... many, maybe even most, of our sports and playground surfaces are in deplorable condition. Many of these are unsafe and even treacherous. We still tolerate this even though we have the finest agronomic knowledge, turfgrasses and equipment at our disposal. Add this to our collective enthusiasm for physical activity... watching and participating... and we have a powerful force to construct quality fields, maintain them, and/or correct existing sports field turf problems. We believe that lack of vital information and blurred focus of intentions have slowed progress. NSTC will take all of this talent, information and material, focus, then project the essence into an active force for sports and playground safety.

Who do we need to get involved? Support from organizations, institutions and associations is essential, but individual efforts from parents, teachers and coaches is mandatory. We need input... emotional, testimonial, technical, statistical and physical. Then we need funds to fuel the mechanism. We need *you*.

We need community liaison, people who will grab the ball on a local level and run with it. We need people in the right places who can implement a plan to tackle a problem, devise game plans in the community and make them work. We need people of conscience who realize that falling is a part of physical activity and that getting up and shaking it off is a *right*, and pain and injury are not acceptable. We need *you*.

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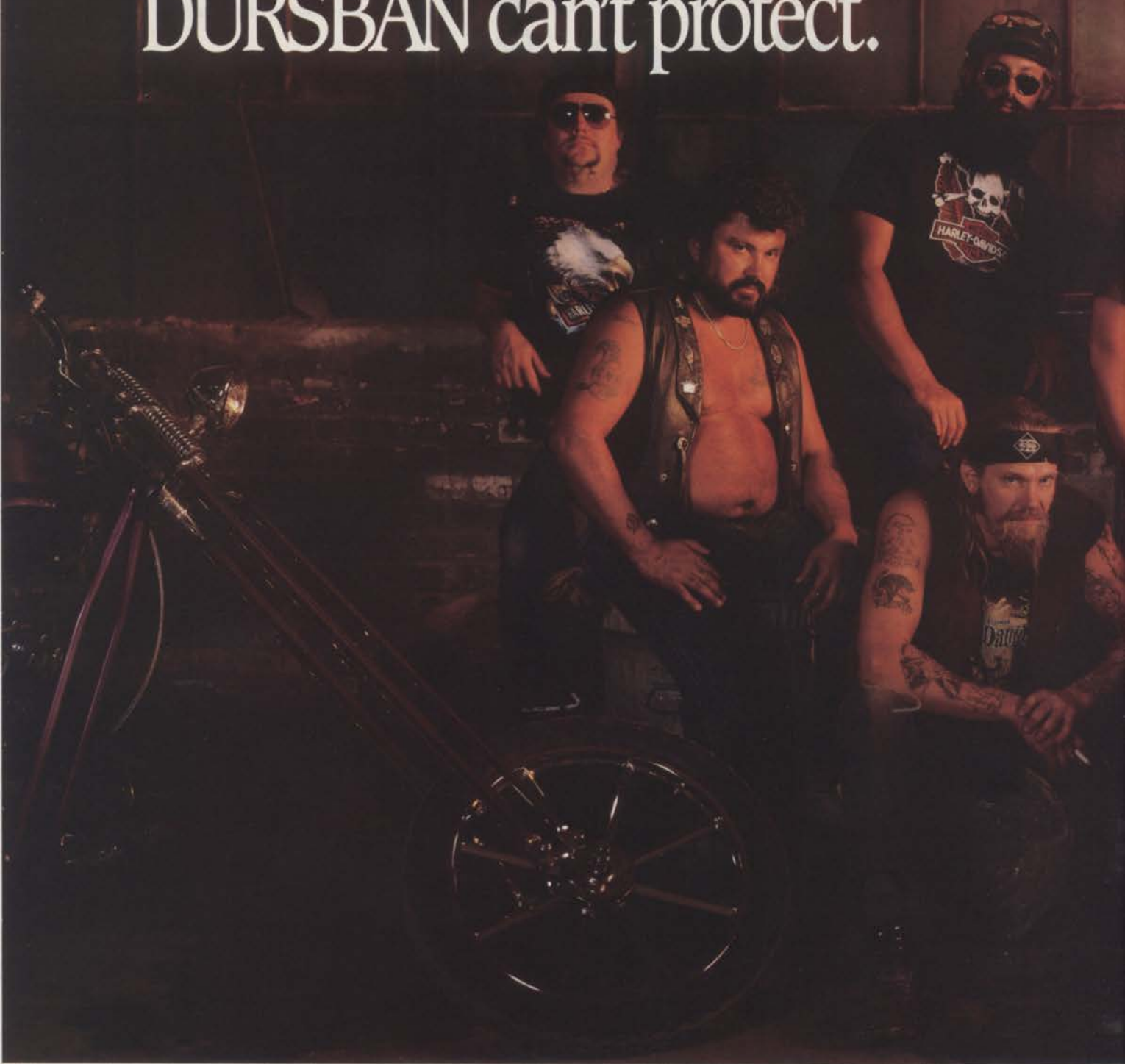
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keep surface feeders off your
turf. Wearing a black leather
jacket during application is, of
course, not recommended.

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Circle 18 on reader service card

RETIREMENT PLANNING: WHEN YOU CAN'T TAKE IT WITH YOU

PEOPLE MAKE THOUSANDS OF plans for life, but sometimes none for death. Unfortunately, family and friends may pay the price for those who die without an estate plan.

People who die without a will, for example, risk having their assets tied up for years in probate. And when it's all over, their intended beneficiaries might end up with far less than intended. Worse yet, a poorly planned estate means added frustration and anguish for already distraught family members and friends.

A good place to start is a will, which is the cornerstone of estate planning; all other factors revolve around it. One way to drive home the importance of a will is by examining how your estate would be divided under your state guidelines if you died without a will.

Additional expenses that sometimes result from not having a will stem more from extra steps that are needed to settle the estate in lieu of directions in a will.

Besides dividing the assets, the will usually spells out who would get custody of the children, if there are minors involved. It also names the person responsible for settling the affairs of the estate (the executor), which is another decision that sometimes can lead to disputes and problems.

In addition to drawing up a will, estate planning involves taking a look at investments and assets to make sure they are properly placed. A common mistake is not having enough readily available money in an estate to pay the inheritance or estate taxes survivors often face.

For example, a person may have a large amount of his estate tied up in the family house. Faced with a sizable inheritance tax bill, survivors may be forced to sell the house to obtain the money to pay the bill.

A person can avoid this trap by gradually converting stocks, bonds and property into cash investments or by buying a life insurance policy, which pays cash directly to a named beneficiary.

Another potentially costly mistake involves people with estates worth more than \$600,000. As long as money is passed from one spouse to the surviving spouse, the survivor pays no federal estate tax regardless of the size of the estate. However, when the surviving spouse dies, other heirs face paying a federal estate tax on the amount that exceeds \$600,000.

One way individuals can avoid large tax bills is by setting up a trust, which is an arrangement for a third party (often a bank) to control assets for another person's benefits until a specified time. One of the best things about trusts is that they can be used to transfer just about any asset to whomever you wish with whatever restrictions you want to impose. In addition, some trusts can be used to reduce taxes, both currently and upon death.

Among their advantages:

- They allow the transfer of assets without the money being subject to probate expenses.
- They can reduce or eliminate federal estate tax and in many cases reduce current income tax liability.
- They allow money to be passed on to heirs gradually or in installments instead of in one lump sum.

With the help of your personal financial planner and the advice of your attorney, you can create an estate plan that will allow the greatest amount of wealth to pass to your designated beneficiaries with a minimum of difficulty.—IDS Financial Services ■

MAKING YOUR RETIREMENT NEST EGG WORK

MOST PEOPLE LOOK FORWARD to having a lot of money when they retire. Retirees want to keep intact the nest egg they've carefully constructed over a lifetime.

However, many people lacking investment experience will be faced with the problem of managing lump sum distributions from their employer's pension plans. As a result, most retirees must wrestle alone with the responsibility of managing more money than they've ever seen before.

Deadlines heighten the pressure on retirees to find places to invest their lump sum distributions: Once they receive their check, they have only 60 days to decide whether to go into an Individual Retirement Account rollover or do something else. This deadline frequently catches retirees by surprise. Feeling the pressure, some people react emotionally, and invest their cash in the absence of careful analysis.

"Information overload" also can cause retirees to throw up their hands in frustration. They

look at dozens of financial forecasts and become confused. At this point the urge to make a move — any move — can be overpowering.

The amount of retirement income available depends on how each person chooses to invest his or her lump sum distribution. Most people follow one of two paths: an IRA rollover or a non-qualified annuity.

An alternative to paying any current tax is to roll over the taxable portion of the lump sum distribution into an IRA. These accounts combine tax deferral with flexibility. An IRA rollover enables investors to, in effect, create their own personal retirement plans. They can have money in an IRA until April 1 following the year they reach the age of 70 1/2, at which point the IRS requires minimum withdrawals each year based on life expectancy.

Retirees who don't need to withdraw money from an IRA right away can save by deferring taxes. On the other hand, someone who's counting on that IRA for income and takes cash

out on a regular basis can end up outliving the money, unless distributions are based on their recalculated life expectancy. By retiring early, people increase this risk because their payments must stretch over a longer period. That's why some financial planners may suggest purchasing a non-qualified annuity.

Annuities can be tailored to provide income for as long as a retiree lives. There are a number of annuity products, but the typical one makes payments for life. Annuity products can also be structured to continue making payments after death to a spouse or another survivor.

In general, people who take early retirement will likely receive payments for a longer period, so expect the amount of each disbursement to be smaller.

Whether a retiree chooses a non-qualified annuity, an IRA rollover or some other type of distribution, a financial planner can help determine which product addresses your financial objectives, needs and risk tolerance.

PEOPLE



Lowell



Wolfarth

KATHRYN GANGEL WAS APPOINTED customer service representative for Aquatrols. She will assist the sales manager in developing and implementing the company's sales plan and customer services.

Her previous experience includes work at The New Jersey Department of Agriculture.

Taylor was previously manager of Phoenix operations for The Groundskeeper, a Tucson-based corporation.

Kubota Tractor Corp. appointed **Rob-**

ert Lowell regional sales manager and **David Chapman** consumer products dealer development manager.

Lowell will be responsible for dealer development, product training, inventory management and new dealer recruitment in Connecticut, Massachusetts and Rhode Island.

He has 14 years experience with J.I. Case Co./Ingersoll Equipment Co. Before that he worked at International Harvester Co. for eight years.

Chapman will be responsible for new dealer recruitment and providing support to Kubota's regional sales managers. He most recently served as district manager for Deutz-Allis Corp. Before that he was territory manager and dealer manager at Versatile Farm Equipment Corp.

Ron Wolfarth and **Bill Tullos** have been appointed central control sales managers for Rain Bird Inc. Wolfarth will serve the Eastern United States and

Tullos the West.

In their posts, they will supply irrigation consultants and specifiers with detailed information about Maxicom, Rain Bird's computerized control system for multiple site irrigation projects.

Before joining Rain Bird in 1986, Wolfarth worked as an independent irrigation and water management consultant with major landscape architecture firms including Olson and Associates.

Tullos has worked in the landscape and irrigation industry for 16 years. He has been with Rain Bird for five years. Previously, he was general manager of Gator Pumping Modules Inc. and turf sales manager for Florida Irrigation Supply.

Alan Kulibaba has joined Lebanon Total Turf Care, a division of Lebanon Chemical Corp., as sales representative. He will be responsible for sales and service of professional turf accounts in northern New Jersey. ■

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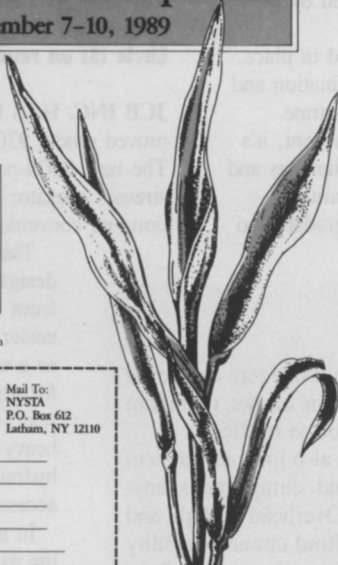
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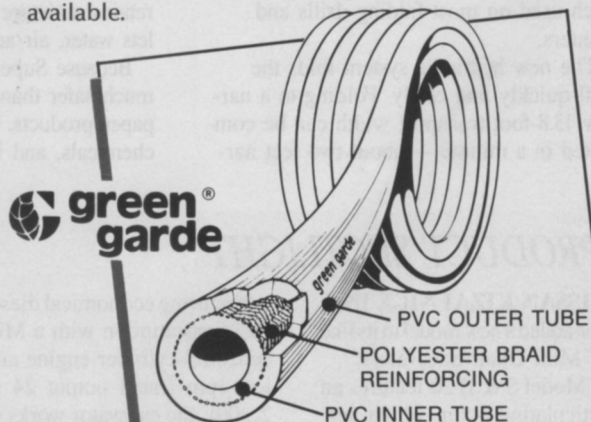
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Circle 12 on reader service card

PRODUCTS

RANSOMES INC. HAS ANNOUNCED an improvement in its Motor 180, one of the industry's most versatile triplex mowers. The Motor 180 is now powered by a 16-h.p. Briggs & Stratton V-twin engine for additional power in all mowing conditions.

The Motor 180 cuts a 71-inch swath. An optional feature is 3-wheel drive, for additional traction and climbing power.

The Motor 180's single-pedal hydrostatic drive creates responsive operation. The operator's foot controls forward and reverse movements, allowing any speed up to 6 mph without shifting.

Circle 127 on reader service card

LESCO INC. HAS INTRODUCED ITS Tournament Turf Marking Paint for athletic fields, irrigation, landscape installation and other turf uses.

Available in 16-ounce cans, the paint comes in white, yellow, red and fluorescent red — all lead-free formulas.

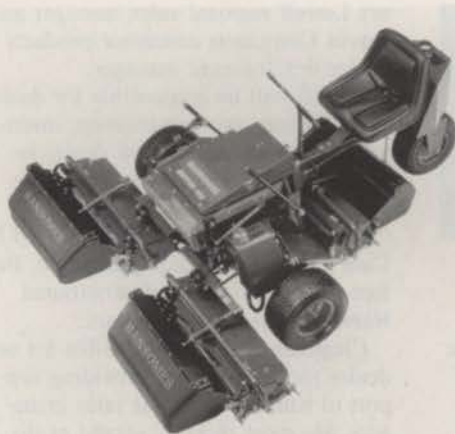
The can fits all standard marking devices and operates in an inverted position.

Circle 128 on reader service card

THE TYE CO. HAS INTRODUCED A 30-foot series V-folding drill featuring a clear view, wishbone hitch and the latest state of the art precision seeding system.

The wishbone hitch gives the operator a clear, end-to-end view of the drill during planting as well as a clear view of the road behind him while in transport (patent pending). Tye's wishbone hitch design eliminates the cumbersome center hitch used on most folding drills and planters.

The new hydraulic system folds the drill quickly and easily. Folding to a narrow 13.8-foot transport width can be completed in a minute — about two feet nar-



Ransomes has added a Briggs & Stratton V-twin engine to its Motor 180 triplex mowers to provide additional power.

rower than most other models. Operators will also like the 15-inch ground clearance.

Four lift-gauge wheels provide optimum flotation to assure positive depth control. Separate hydraulic lift and folding circuits require only two tractor remotes.

Circle 129 on reader service card

SUPERGRO,™ A NEW EROSION CONTROL product, is now available from **Phillips Fibers Corp.**

Engineered to prevent surface erosion while promoting rapid growth of freshly landscaped areas, SuperGro is a flexible composite. It consists of a nonwoven polypropylene fiber mat reinforced by polypropylene netting.

SuperGro secures grass seed in place, retains moisture for seed germination and lets water, air and sunlight penetrate.

Because SuperGro is fire-resistant, it's much safer than straw, wood shavings and paper products. It doesn't contain any chemicals, and is timed biodegradable so

its tracks, while zero-degree tail obstruction allows minimum disruption to traffic.

It can also load any tandem truck and dump spoils anywhere. Overhead skylight and guard afford upward visibility of wires, overhangs, etc. Rubber tracks prevent damage to turf and sidewalks.

126 on reader service card

it will not harm the environment.

A versatile, economical product, SuperGro features numerous applications in landscaping and erosion control along highways, recreation fields and landfills.

Available from Phillips is a four-page brochure including information on availability, packaging and installation.

130 on reader service card

THE DAN 2001 MICRO-Sprinkler is now available from **Netafim Irrigation Inc.** The system regulates flow for all terrain with high uniformity and offers insect and sand protection.

The Dan 2001 is ideal for application in orchards, vineyards, greenhouses, nurseries and for microclimate control. It easily retrofits many existing irrigation systems. The large nozzle diameters and self-cleaning design reduce chances of clogging.

The Dan 2001 is fully flow compensating over a pressure range from 20 psi to 50 psi, assuring balanced water distribution and a uniform, 13-foot to 21-foot wetted diameter.

It's ideal for sloped terrain and longer laterals, resulting in more efficient use of water, energy and irrigation chemicals. The Dan 2001 is available in the following flow rates: GPH 5.5, 9.0, 14.5 and 18.5.

Circle 131 on reader service card

JCB INC. HAS INTRODUCED THE improved model 930 rough terrain forklift. The new 6,000-pound capacity design stresses operator comfort, ease of operation and convenience.

The body and chassis designs give operators new front fenders and steps for easier entry and exit, as well as a new sloping hood design for greater visibility to the rear. The 930 also offers a new heavy-duty fuel tank and hydraulic tank with easier access.

In addition to redesigning the exterior, JCB also improved the operator compartment. Added features include an improved instrument console, hydraulic control levers angled

PRODUCT SPOTLIGHT

NISSAN KIZAI NICE INC. has added a new model to its line of Mini Giant Excavators.

Model S & B 20 features an articulating boom which permits left to right movement without the operator having to move the machine itself. The machine weighs 6,910 pounds and is equipped with a 5-foot by 14-inch backfilling blade.

Featuring economical diesel fuel consumption with a Mitsubishi 4-cylinder engine and low rpm (rated output 24 at 2,300), the excavator works in the tightest spaces where costly hand labor normally would be the only answer.

It's the only 360-degree tracked excavator that can dig, turn and dump within the width of

toward the operator for easier reach, larger door width, bigger grab handles and improved Bostrum "U" series seat.

JCB provides a choice of 2-wheel or 4-wheel drive, four mast options and either standard carriage or ITA Class III carriage.

Circle 132 on reader service card

THE NEW B20 TRACTOR FROM Kubota Tractor Corp. is an industrial strength compact tractor capable of being equipped with a full-scale backhoe and loader.

Powered by a 20-h.p. engine, the B20 was designed to meet the rigorous demands of front loader, backhoe, trencher and box scraper work while retaining the versatility and maneuverability of compact tractors.

With its liquid-cooled 3-cylinder diesel engine, the B20 features hydrostatic transmission and standard 4-wheel drive for greater traction and power.

Kubota's B20 is equipped with a powerful 12.7 gpm dual-pump hydraulic system to provide ample volume for handling the loader and backhoe. The integral power steering, slanted hard nose hood and stronger front axle serve to expand the capabilities of this unit.

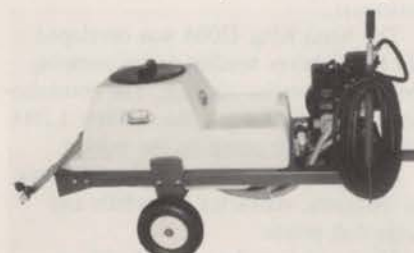
The B20 also features a rear PTO and

3-point hitch allowing for additional implements such as a box scraper, rear mount mower, rotary cutter, post hole digger and trencher to be quickly attached and detached.

Operator comfort is maximized on Kubota's B20 model. A slide-adjustable, high-back deluxe seat reduces operator fatigue. The seat can be quickly reversed with a single lock lever, properly positioning it for the operator to begin backhoe work.

Circle 133 on reader service card

THE BROYHILL CO. HAS designed a 30-gallon lawn and garden sprayer with an exclusive low profile tank design



Broyhill's 30-gallon lawn and garden sprayer.

and 10-inch easy access lid for convenient tank rinsing.

The tank holds 20 percent more than standard 25-gallon sprayers. The design in-

cludes a garden tool/chemical container storage area with drain to eliminate rain collection. The unit can be towed with the engine in front or back for less operator noise.

Standard features include by-pass agitation, relief valve, 80-inch coverage boom, filter, 150 psi roller pump and a 3-h.p. Briggs & Stratton engine. All controls are mounted on the spray gun holder for easier operation.

Circle 134 on reader service card.

WOODS, A DIVISION OF HESSTON, has introduced a three-model line of commercial grade walk-behind mowers. Mowing widths are 36 inches, 48 inches and 61 inches with adjustable cutting height from 1 1/2 inches to 4 inches in 1/4 inch increments.

A heavy-duty hydrostatic transaxle drive provides smooth operation, fast response and eliminates clutching. One lever controls speed which ranges from 0 mph to 6 mph including up to 2 mph in reverse. Dual disc brakes are employed for precision steering.

Large 16-inch diameter drive tires improve traction. An oil bath gear drive is used to drive both wheels to assure straight tracking. The mower deck on these units is welded from 10-gallon steel



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- 1 Double V band wheel drive belt
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- 3 Lifetime warranty on the cutting deck
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- 5 Special high lift blades

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with double reinforced side skirts. Kohler engines power the mowers, and fuel tank capacity is 3 gallons.

Circle 135 on reader service card

RAIN BIRD HAS INTRODUCED

Night Bird, a new state of the art, low-voltage landscape lighting system. Designed for residential and light commercial applications, the system includes path, well, flood and spotlights, as well as two weatherproofed timer/photo cell/transformer units.

The line is designed with a standard base and interchangeable heads, making it easy to stock and install. Floodlights are easily converted to spotlights with the addition of an optional snoot. Colored glass lenses are available in blue, amber, green and red. A 200-watt timer operates 10 20-watt lights installed with simple loop wiring. All lights are designed to blend into landscaping and are constructed of corrosion-resistant, stainless steel and cast aluminum for durability.

Glass lenses assure true color and shape under all climatic conditions. Specially treated rubber gaskets provide a solid, long-lasting seal. High-intensity halogen bulbs guarantee true color and a bright, diffused light.

Circle 136 on reader service card

A PRODUCT THAT PROTECTS SKIN from outdoor plants, grasses and foliage is now available from **Stockhausen Inc.**

Stokogard is an odorless, silicone-free cream that forms an invisible shield on the skin. When applied liberally before contact with plant oils and other elements, its protection is effective for up to eight hours.

Virtually any job in which skin is exposed to outdoor elements can benefit from using the cream, including forestry, farming, landscaping and contracting.

Circle 137 on reader service card

BECKETT CORP. HAS CREATED A submersible pump small enough to fit in a 6-inch pipe, but stout enough to drain a basement.

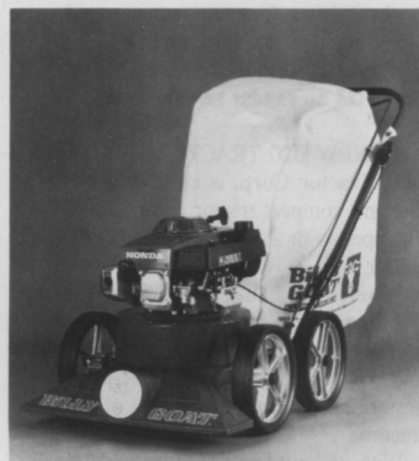
The Versa King 1200A was developed for those chores needing prime pumping power in a precise package. The corrosion-resistant Versa King is the smallest 1,200-gallon-per-hour pump on the market.

For landscaping, the pump can be used in fountains, statuary, waterfalls and large fish ponds.

The pumps can be ordered with an automatic float switch, and are available with either a 10-foot or 20-foot cord. The Versa King V-1200A models are UL listed.

Circle 138 on reader service card.

BILLY GOAT INDUSTRIES HAS ANNOUNCED the availability of a 5.5-horsepower Honda engine on its KD501 suction sweeper. It is the only suction



Billy Goat adds a Honda motor to its KD501.

sweeper in its class to offer the new overhead valve Honda engine.

The sweeper features a high-capacity bag with handles and an L-shaped side zipper for emptying.

For maneuverability and efficiency, a lightweight snout and 26-inch wide cleaning path are provided.

(continued on page 69).

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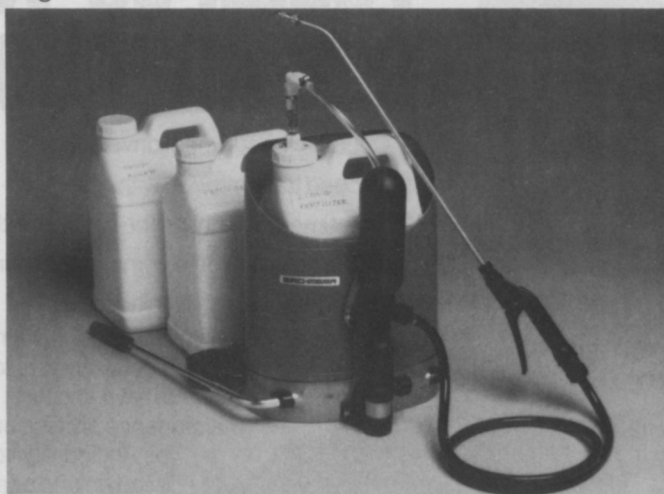


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Circle 32 on reader service card

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Join the landscape professionals at the 1989 Green Team Conference and Trade Show, "Gateway to the '90s." This four-day event is your entree to a two-day exhibition of the industry's finest products and services. "Gateway to the '90s" is sponsored by the Associated Landscape Contractors of America and the Professional Grounds Management Society and features three full days of educational programs that:

- give you the most up-to-date information on horticultural practices, management techniques and business matters.
- examine in detail subjects ranging from landscape design/build and hydroseeding to sales and contract techniques.

It's four days filled with opportunities to learn — to socialize — to exchange ideas — to see and enjoy.

Plan to attend.

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Need more information on the 1989 Green Team Conference and Trade Show?

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Circle 33 on reader service card

FOCUS ON: PRODUCT PROFILE

PREVENTIVE MEASURES DETER CUSTOMER LOSS



Don Strauss takes a preventive approach to caring for turf. Here he inspects a customer's turf for signs of insects.

DAN STRAUSS' CUSTOMERS HAVE some pretty big lawns which can be a challenge when it comes to insect control.

"My customer's average lawn size is 15,000-square-feet," said Strauss, owner of a Spring-Green Lawn Care franchise in Lancaster, Pa. Keeping those customers happy is not easy so he considers every available option.

A few years ago, Strauss attempted insect control on a curative basis vs. a preventive basis.

In 1986, he hired an employee to scout the lawns of 350 customers in the Lancaster area. "By tracking we found that more than 80 percent of all lawns in our territory had insect infestations," Strauss explained.

He chose to apply selective granular treatments of diazinon and Oftanol. But the number and size of lawns made it difficult to thoroughly inspect each property and stop the insect problem.

LABOR INTENSIVE. "The problem with the curative approach is it's difficult to be effective because it's labor intensive — a lot of inspections need to be made," Strauss said. "I believe in minimizing the use of pesticides, but they're still valuable tools in our industry."

In 1987, he took a different approach. During Round 2, Strauss tank mixed Dursban™ turf insecticide with pendimethalin, Feromec AC and fertilizer.

"A funny thing happened," he said. "The phones stopped ringing with callbacks for insect damage."

He said the history of surface-feeding insect damage in his area warranted his

decision. "The two biggest pests are sod webworms and chinchbugs, and Dursban insecticides are excellent on them."

IMPROVED BOTTOM LINE. "I found by tank mixing the insecticide, we were able to concentrate more on customer education, tree work and selling other services," he said. "The time and money we saved preventing callbacks improved our bottom line."

"The best thing about this program is it costs me 40 percent less, based on labor, equipment and materials," Strauss said.

In 1988, he refined the program. In Round 3, if the lawn still had an insect problem it received a liquid application of Dursban turf insecticide and, depending on the weather, a weed and feed custom blend. If no insect damage was apparent, lawn technicians proceeded with a granular application of sulphur-coated urea.

"For me, treating lawns in a preventive manner means a smiling customer," Strauss said. And those smiling customers pass the word on. According to Strauss, 23 percent of his business comes through referrals.

CUSTOMER EDUCATION. Strauss has fought back the wave of anti-pesticide publicity by doing a lot of customer education. "We never minimize what we do and we give them terms they can understand. It's difficult for consumers because most have no chemical knowledge — no relative understanding of what we're doing."

"I feel confident using Dursban. It's one of the most extensively studied materials in our tool box and the only one with human exposure studies," Strauss said.

Tests conducted by Dow show that "no toxic effects have been observed in humans exposed to chlorpyrifos during operations requisite to application of Dursban insecticides or in controlled laboratory studies."

Strauss discovered when it came to treating his customers' large lawns, a preventive approach to insect damage was best. "For me, the benefits of preventive, broadcast treatments far outweigh curative, spot treatments," he said. "It's less costly, there are fewer callbacks and more satisfied customers."

Circle 150 on reader service card.

While Kujawa is looking forward to this year's show, he's also enthused about what will result next year when the three groups combine efforts for one trade show.

"The original concept of the Green Team was to bring groups together to cooperate on one single entity — a trade show," he said. "ALCA and PGMS are looking for bigger and better things when we join PLCAA next year. When different groups cooperate, they serve their members and the industry better."

Monday offers two optional tours. The first is of Ralston Purina's corporate garden and the Missouri Botanical Garden.

The afternoon tour will take attendees to Monsanto World Headquarters, which has a collection of native plantings including prairie plantings and a perennial garden. — *David Westrick* ■

The author is Assistant Editor of Lawn and Landscape Maintenance magazine.

Spray Rigs (continued from page 38)

able pieces will allow you to store critical parts of the system indoors during inclement weather, and make it much easier to blow moisture from sections of the system (remember the "small drop-let effect") with a compressed air blower.

SUMMARY. Many urban pest management practitioners have experienced serious problems with tank freezing, and in recent years, tank crystallization in their spray equipment. In this article I have tried to share some of my understanding of the dynamics of these problems, and some of my philosophy with respect to problem solving.

With the winter season just around the corner, now is the time to review your cold season operating procedures. Like any other business problem, tank freezing and crystallization are manageable, but you must be proactive in your approach.

Armed with the knowledge of why these problems occur will put you in a much better position to prevent their occurrence.

You owe it to your customers, your employees and to your bottom line to solve these problems before they occur. — *Mike Holcomb* ■

The author is an urban and industrial entomologist in Decatur, Ala.

CALENDAR

OCT. 21

Estimating and Management Principles, sponsored by the Associated Landscape Contractors of America, Milwaukee Area Technical College, Milwaukee, Wis. Contact: ALCA, 405 N. Washington St., Falls Church, Va. 22046; 703/241-4004.

OCT. 25-27

Annual Southwest Turfgrass Association Conference, Albuquerque Convention Center, Albuquerque, N.M. Contact: Bill Keneipp, 7017 Kiowa, N.E., Albuquerque, N.M. 87110; 505/884-3125.

NOV. 6-9

The 10th Annual Professional Lawn Care Association of America Conference and Trade Show, Las Vegas, Nev. Contact: Jim Brooks, 1000 Johnson Ferry Rd. NE, Suite C-135, Marietta, Ga. 30068-2112; 404/977-5222 or 800/458-3466.

NOV. 7-8

Second Annual Guelph Turfgrass Symposium, College Inn, Guelph, Ontario. Contact: Division of Continuing Education, Room 160, Johnston Hall, University of Guelph, Guelph, Ontario N1G 2W1; 519/824-4120 ext. 3956.

NOV. 7-10

New York State Turfgrass Association Annual Conference and Trade Show, Rochester Riverside Convention Center, Rochester, N.Y. Contact: Beth Seme, P.O. Box 612, Latham, N.Y. 12110; 518/783-1229.

NOV. 8-11

International Trade Fair for Design, Equipping and Care of Amenity Areas, Cologne, West Germany. Participants include those interested in landscape construction, plants and seeds, chemical and biological products and golf course construction. Contact: Koln Messe, 221/821-2912.

NOV. 10-13

Green Team Conference and Trade Show, Cervantes Convention Center, Omni Hotel, St. Louis, Mo. Contact: Associated Landscape Contractors of America, 703/241-4004 or Professional Grounds Management Society, 301/667-1833.

NOV. 12-15

Irrigation Association Annual Conference and Show, Anaheim Convention Center/Marriott, Anaheim, Calif. Contact: R.C.

Sears, 1911 N. Fort Myer Dr., Suite 1009, Arlington Va. 22209-1630; 703/524-1200.

NOV. 14-15

1989 Indiana State Lawn Care Association Conference and Trade Show, Indiana State Fairgrounds, Indianapolis. Contact: Robert Andrews, ISLCA, P.O. Box 481, Carmel, Ind. 46032; 317/575-9010.

NOV. 16-18

Second Annual Landscape Maintenance Association Meeting and Equipment Demonstration, Orlando, Fla. Contact: LMA, P.O. Box 728, Largo, Fla. 34649; 813/584-2312.

NOV. 28-30

Turfgrass and Ornamental Chemical Seminar, Purdue University, West Lafayette, Ind. Contact: Barb Meyer, 317/494-7221.

DEC. 4-7

Ohio Turfgrass Conference and Regional Show, Ohio Center, Columbus, Ohio. Contact: John Street, 2021 Coffey Rd., Columbus, Ohio, 43210; 614/292-2601.

DEC. 4-5

Second Annual Southern Grounds and Turf Maintenance Exposition, Myrtle Beach Convention Center, S.C. Contact: Special Events Division, State Tech Board, Columbia, S.C.; 803/737-9351.

DEC. 5-6

The 36th Annual Rocky Mountain Regional Turfgrass Conference and Trade Show, Holiday Inn, I-70 and Chambers Road, Denver, Colo. Contact: Bill Shrum, P.O. Box 903, Parker, Colo. 80134; 303/688-2268.

DEC. 11-13

20th Annual Georgia Turfgrass Conference and Trade Show, Hyatt Atlanta Airport at Georgia International Convention and Trade Center, College Park, Ga. Contact: East Georgia Cooperative Extension Service, 2400 College Station Rd., Athens, Ga. 30605; 912/681-5189.

DEC. 13-15

Desert Turfgrass/Landscape Conference and Show, Riviera Hotel, Las Vegas, Nev. Contact: Desert Turfgrass Show, 3376 S. Eastern Ave., Suite 148, Las Vegas, Nev. 89109; 702/735-0000. ■

CLASSIFIEDS

RATES

All classified advertising is 55 cents per word. For box numbers, add \$1 plus six words. All classified ads must be received by the publisher before the 10th of the month preceding publication and be accompanied by cash or money order covering full payment. Submit ads to: Lawn and Landscape Maintenance magazine, 4012 Bridge Avenue, Cleveland, Ohio 44113. Fax: 216/961-0364.

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WANTED TO ACQUIRE

Lawn care companies of all sizes in U.S. and Canada being sought by national corporation. Complete buy out or stay and grow with us. If interested please call me directly: Don Karnes, Senior Vice President, Tru Green Corp., 404/442-8700. Strict confidentiality maintained.

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Lawn care companies of all sizes anywhere in U.S. wanted to purchase by national corporation. If interested please respond to: Lawn & Landscape Maintenance, Box 329, 4012 Bridge Ave., Cleveland, Ohio 44113. Strict confidentiality maintained.

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LAWN CARE EQUIPMENT

Hannay reels new in-the-box, EI526s, EI530s, \$349; lawn spray hose, 275 psi and 600 psi, all sizes; original Imler measuring wheels, \$48; glycerin-filled gauges, 0-60 psi to 0-1,000 psi, \$19.95; ChemLawn guns, \$75.95; lawn spray boots, \$16.95; lawn spray gloves, \$1.75/pair. Call Hersch's Chemical Inc. 800/843-LAWN — outside of Michigan 313/543-2200

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Intermediate mower maintenance field and shop repair; efficient/profitable mowing techniques; professional shrub trimming, plant installation, basic landscape plan drawing, etc. ENGLISH

AND SPANISH. Write for free brochure: C.D. Anderson Landscape Videos, 515 Ogden Ave., Downers Grove, Ill. 60515. 800/937-0399.



TURF SPRAYER

Want the hottest new sprayer on the turf market? How about a unit that has NO gas engine, NO 12-volt system and NO noise, but is powered by a gear pump which is ground driven by the wheels. This is our WALKOVER sprayer which features. 1. Accurate spray rates, 2. simple to use, 3. Precision manufacturing. Call CHEM-TEC today for more information 800/848-8507.

88 FORD 5610 NUNES MOWER

Designed to mow large areas of turfgrass, 17-foot cutting width, cutting speeds up to 6 mph. Large flotation tires. Excellent condition. Call Artistic Maintenance, 714/458-2605.

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FREE CATALOG



COMPLETE TRANSMISSION

159.99

PART # JT-215

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BUNTON 10" COMPLETE ASSBLY	23.95
SNAPPER 7" STEEL WHEELS	4.75
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HELP WANTED

FOREMAN POSITION

Top firm needs foreman. Quality conscious Texas-based landscape management firm has im-

mediate opening for detail-oriented landscape maintenance foreman. If you have outstanding professional and horticultural skills and are not afraid of hard and healthy teamwork, then you could qualify for a top position with the finest landscape firm in the Southwest. Outstanding compensation and opportunity. Reply today to: Lawn & Landscape Maintenance, Box 325, 4012 Bridge Ave., Cleveland, Ohio, 44113.

LANDSCAPE MAINTENANCE FOREMAN

Long standing company based in the Las Vegas valley needs an experienced, responsible foreman. Needs full knowledge in all aspects of landscape maintenance, trees, lawns, irrigation and controllers. Quality conscious firm has immediate opening. Send resume and job salary history to: JM Landscape Company, P.O. Box 92121, Henderson, Nev. 89009.

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Locations in the North Central, Northeast, Southeast and West. Use your outstanding leadership ability and people-handling skills to establish a career with a **real future!** As the recognized leader in lawn care services to both residential and commercial accounts, we are expanding our market penetration and need talented, self-motivated **branch and sales managers who can take us to the top!**

You will receive:

- competitive salary
- complete training
- car allowance/company vehicle
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If you have:

- profit and loss responsibility experience
- sales or sales management experience
- supervisory experience

Start your future **today** by sending your resume in complete confidence to: Orkin Lawn Care, Pat Guy, 2170 Piedmont Rd., NE, Atlanta, Ga. 30324.

It pays to advertise in the
LAWN & LANDSCAPE MAINTENANCE
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To place an order, write to **LAWN & LANDSCAPE MAINTENANCE**, 4012 Bridge Avenue, Cleveland, Ohio 44113

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Products

(continued from page 64)

The KD50IH adds a convenient lever on the handle to allow operators quick adjustment of the front wheel height.

Circle 139 on reader service card

AN IMPROVED MODEL 2340-48 pull-behind core plug aerator in a 48-inch wide swath is now available from **Feldmann**. Productivity is 47 percent faster than a 25-inch aeration swath and 33 percent faster than a 32-inch swath.

The unit design is similar to the 32-inch width 2340. To operate, simply connect with hitch pin on draw bar. Core plug lawn aeration is quick and the converter is in a competitive position for earning greater profits.

The lift-up handles will promptly pop the 10-inch pneumatic tires into position for transport, and just as quickly let the unit down to start core plugging. Penetration up to 2.5 inches allows air, water and fertilizer to penetrate the root system, as well as promote thatch deterioration.

In addition to the wider 48-inch width, a gang bracket is available and will gang three units together for an 82-inch swath with model 2340 and a 132-inch swath with model 2340-48 pull-behind core plug aerators.

Circle 140 on reader service card

AN OPTIONAL DOZER BLADE from **Mustang Manufacturing Co. Inc.** turns Mustang models 930, 940 and 960 skid steer loaders into versatile machines for landscaping uses.

Blade widths range from 5 feet to 8 feet and are made of reinforced welded steel.

Optional hydraulic angle positioning provides a 30-degree offset in each direc-

tion, and an optional backing extension increases blade height.

Circle 141 on reader service card

GREEN-SHIELD, A NEW EFFECTIVE greenhouse and nursery disinfectant and algicide is now available from **Whitmire Research Laboratories Inc.**

Green-Shield is a 20 percent quarternary ammonium compound with broad spectrum bactericidal, fungicidal, viral and algal activity. Used regularly, the product is designed to reduce plant losses caused by disease, and eliminate algae which harbor pests.

Green-Shield is more effective, but less expensive to use than bleach which has often been used as a disinfectant.

The product is useful in preventing cross contamination by bacteria, fungi, algae and viruses and is recommended for regular use in greenhouses and nur-

series, especially between crops on benches.

Circle 142 on reader service card.

STANLEY'S PROFESSIONAL MEAS-uring Wheel is now available to perform long distance measurements vertically, overhead and around corners up to 1,000 feet without stooping or needing a helper.

The 39-012 model has a 1-foot wheel circumference and extra wide tire for all indoor and most outdoor measuring needs. The 39-036 model has a 3-foot wheel circumference and a Veeder-Root counter for all outdoor measuring tasks.

Both models are compact and lightweight. Both feature telescoping handles with length variances from 19 inches to 38 inches, plus accurate counters with push-button resetting. Each measuring wheel is rimmed with a Neoprene tire providing excellent traction on most surfaces.

Circle 143 on reader service card.

PROFESSIONAL LANDSCAPERS who have lost valuable time and money collecting grass clippings now have another option. **SAK-VAC**, a new product invented by Robert Jarosak of New York, can be attached to any large walk-behind cutting machine.

SAK-VAC mounts on to any existing equipment and provides the following features: shreds leaves to a true 6-to-1 ration saving dumping costs and time, improves the time and speed required to mow any area in addition to cutting maintenance costs because of shorter operating time, sturdy steel chute connects directly to any walker's outlet and heavy-duty 5 h.p. Briggs & Stratton engine with oil alert features powers the SAK-VAC, enabling mowing in the rain with minimal clipping buildup.

Circle 144 on reader service card



Whitmire's new disinfectant and algicide.

To Bill
 Date 9/21 Time 8:42

WHILE YOU WERE OUT
 M. Susan Jones
 of 2087 Cowan Rd

Phone _____
 Area Code _____ Number _____ Extension _____

TELEPHONED	<input checked="" type="checkbox"/>	PLEASE CALL	
CALLED TO SEE YOU		WILL CALL AGAIN	
WANTS TO SEE YOU		URGENT	

☐ RETURNED YOUR CALL

Message _____
Says insecticide
didn't work -

Beth
 Operator

Management Series™

To Bill
 Date 8/27 Time 3:14

WHILE YOU WERE OUT
 M. Mrs. Lingenfelter
 of 952 Macedonia

Phone _____
 Area Code _____ Number _____ Extension _____

TELEPHONED		PLEASE CALL	
CALLED TO SEE YOU		WILL CALL AGAIN	
WANTS TO SEE YOU	<input checked="" type="checkbox"/>	URGENT	

☐ RETURNED YOUR CALL

Message _____
Insect damage. Wants
lawn re-seeded

Beth
 Operator

Management Series™

Triumph gets rid of the toughest

Constant callbacks and retreatments can drive even the best lawn care business right into the ground.

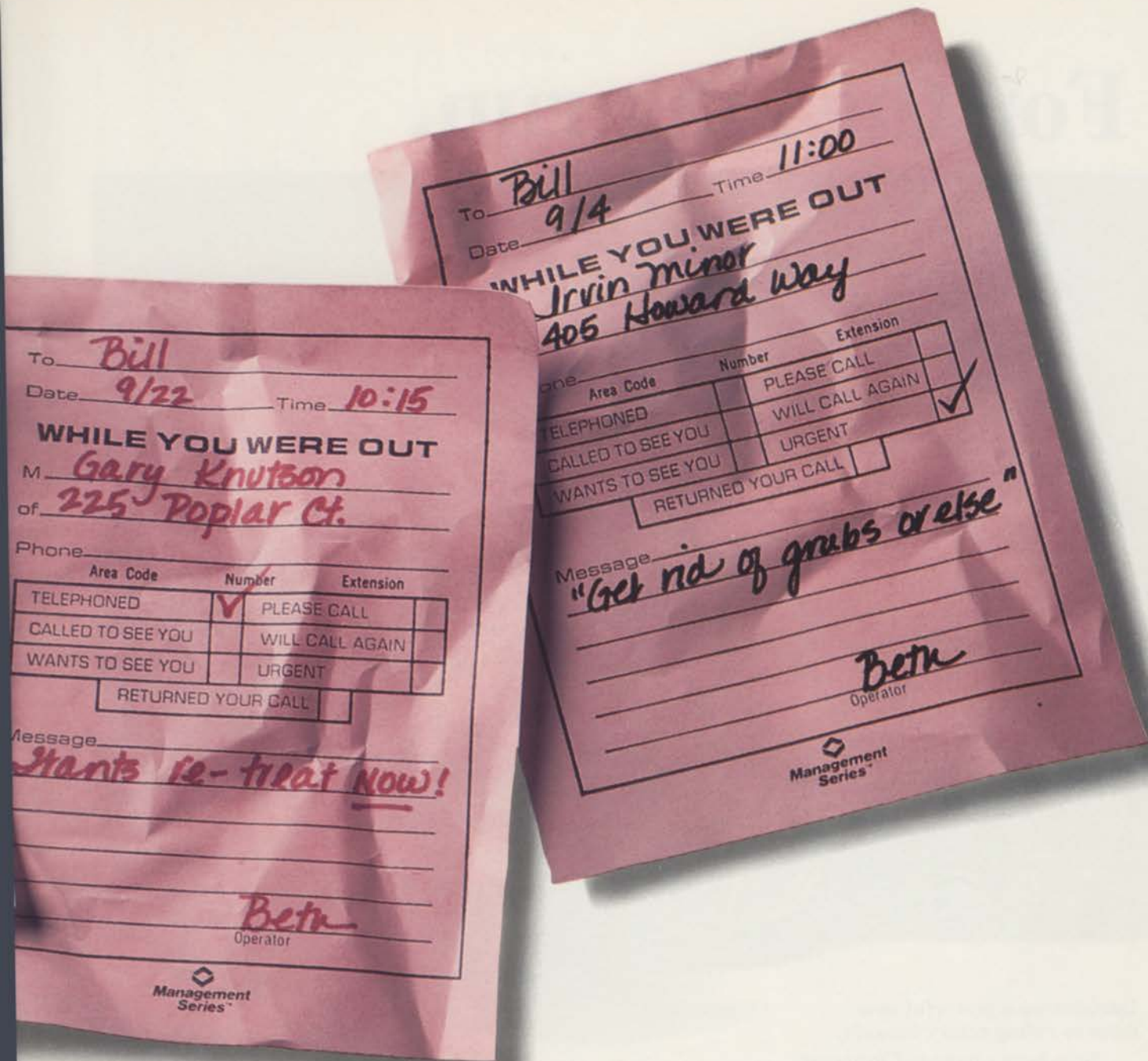
But you can reduce your callbacks —and increase

your profits— simply by replacing whatever insecticide you've been using with Triumph®.

Because no other insecticide is proven more effective

at controlling problem turf pests, including white grubs and mole crickets.

For example, in 10 years of university testing, Triumph has been shown to deliver



turf pests, including these.

90 percent control of white grubs within just 2-3 days of application.

And, unlike other insecticides, Triumph consistently provides lasting control

for a full 8-10 weeks. So one late summer or early fall application is all you need for effective turf protection.

Which doesn't mean you won't still collect notes from

your clients.

Just that they'll more often be the green, negotiable variety.



sale to and use only by certified applicators or persons under their direct supervision, and only for those uses covered by the applicator certification.

Circle 30 on reader service card

For the long run.



Introducing a powerful new force in riding rotary mowers.

Now there's more to Cushman® Front Line® Mowers than top cutting performance. More power. More operator comfort. More endurance.

Now there's the new diesel-powered model Cushman 807.

Its totally integrated power train and new hydraulically-powered steering gives you unmatched performance over the long run. The 807 dispatches thick, wet grass on tricky maneuvers around obstacles without losing

ground speed. No other rotary mower gives you a cleaner cut.

At the heart of the new, four-wheel 807 is a powerful 21.5 horsepower, 3-cylinder Kubota 950 diesel engine. We've also included a heavy-duty Donaldson air cleaner and a new, heavy-duty Cushman PTO clutch to keep your new Cushman Front Line running longer. A complete family of Cushman Front Lines and a wide range of accessories are available to meet all your needs all

year 'round.

Choose a 3 or 4 wheel design with 60- or 72-inch side or rear discharge mower deck. Or add the exclusive Cushman Grass Caddy™ system, which lets you cut, catch, and hydraulically dump 16 bushels of clippings without leaving the seat.

For a convincing demonstration contact your Cushman dealer today. Or call toll-free: 1-800-228-4444.

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Circle 41 on reader service card