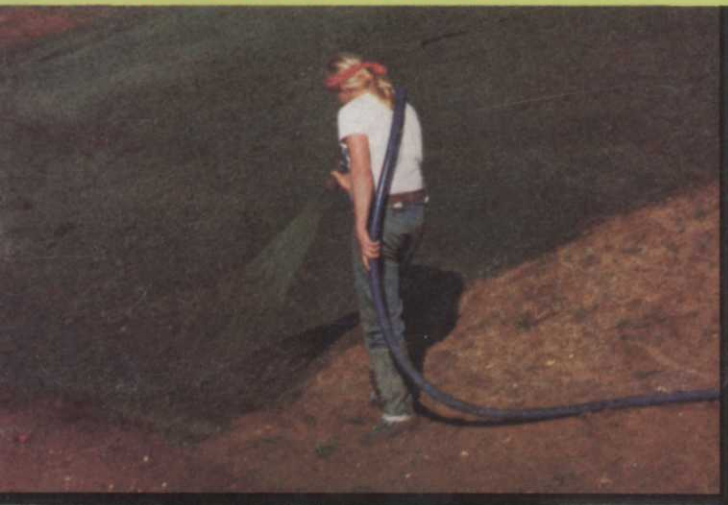
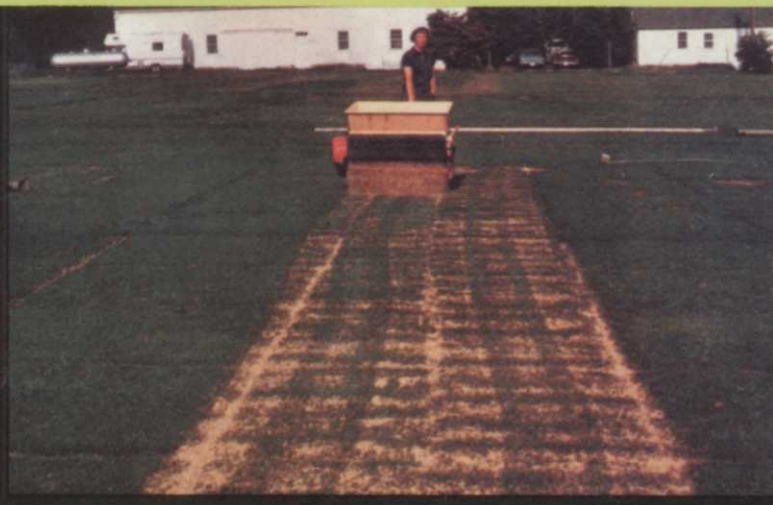
WEEDS TREES & TURF

ONE DOLLAR • MAY 1977

HYDRO-MULCHING AS AN ALTERNATIVE

TOPDRESSING WITH SAND





LANDSCAPING THE MULTI-FAMILY COMPLEX

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For less money than any other major turf insecticide, DURSBAN* brand insecticides can keep more than a dozen insect pests from turning healthy turf into a teeming insect jungle. Chinch bugs, sod webworms, you name it. If it's a major turf insect problem, DURSBAN 2E or more concentrated DURSBAN 4E probably controls it. Economically. Just one application of either product provides several weeks of effective residual insect control. Simply mix with water and spray.

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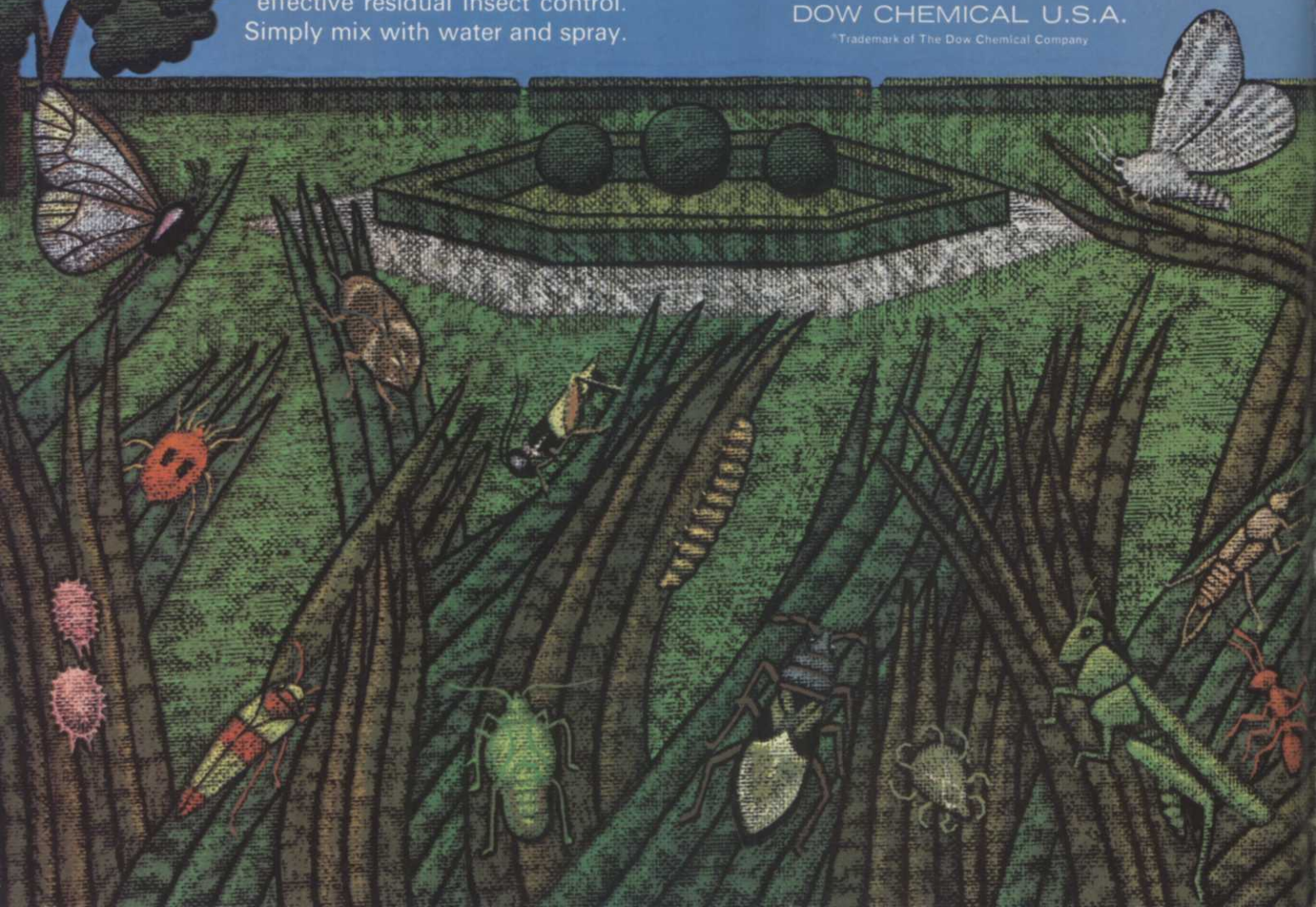

WEEDS TREES & TURF®

MAY 1977, Vol. 16, No. 5

14 Landscaping the Multi-Family Complex — How one landscape contractor turned an old, abandoned airstrip into a masterpiece of color.

18 Hydro-Mulching as an Alternative — Hydro-mulching is emerging as an effective and profitable method of turfgrass establishment.

22 Reflections on Fusarium Blight — Dr. Richard Smiley offers some practical advice on short and long range control of the devastating disease.

30 Topdressing with Sand — Tests at the University of Maryland show promise for this inexpensive turfgrass application.

ON THE COVER — This month WEEDS TREES & TURF highlights four important facets of our Green Industry.

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Established by years of consistent performance.

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

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

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TO OUR READERS

Congratulations — this is the season when the fruits of your labor are most evident. It's a delight to drive home in the evenings now, past the peopled golf courses and busy athletic fields with spring practice in full swing.

Entering my subdivision, which is built in a valley, I see even more Green Industry labors — beautiful flowering dogwoods, birch and red maple, lush evergreens, nearly perfect lawns and tree lawns.

Each evening I notice trucks from new lawn care companies as well as established landscape contractors and tree care companies. And to think, each year it will get more beautiful as the six-year-old development takes on more character and the feeling of establishment.

In Cobbs County, Georgia, a multi-family complex took on this character immediately, thanks, in large measure, to the determination and talent of a young landscape contractor, but see for yourself on page 14. The contractor, Jim Gibbs, told me a story about work attitude, and, although it is about another industry, I pass it along as the concept is applicable to all of us.

One late spring afternoon, two railroad track gang workers were lining up crossties when a train pulled up and an imposing man in a pinstripe suit got off.

"Hi, Bill", said the man to the older worker. "How are Joan and the children?"

The conversation went on a few minutes longer, then the man got back on the train and it pulled away.

The younger worker, who had stood in silence during the conversation, said, "Bill, do you know who that was?"

"Sure," said Bill. "That's the president of the railroad."

"How do you know him?" the younger worker asked in amazement.

"Why," said Bill, "thirty years ago we worked on a track gang together."

After a long silence, the younger worker said, "Bill, I don't mean to hurt your feelings, but have you ever wondered why, after 30 years, he's the company president and you're still on the track gang?"

"Sure," said Bill. "I've thought about it a lot. Thirty years ago I was working for 35 cents an hour. Today I work for $3.75 an hour. Thirty years ago he was working for the railroad."

This month we take a long, hard look at Fusarium blight, see page 22. Dr. Richard W. Smiley of the New York State College of Agriculture and Life Sciences at Cornell, prepared the article. He recommends you take a multi-pronged approach to the disease. It's well worth reading.

At the University of Maryland, Dr. Douglas Hawes is working with sand as a topdressing for turfgrass, see page 30. Dr. Hawes' four management tools are sand versus none and summer versus winter fertilization. This low-cost application shows promise for some turfgrass combinations.

Gail D. Hogan

DACONIL 2787®
Pours it to nine fungus diseases.

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

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

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

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Government News

Douglas M. Costle has been confirmed by the Senate as Administrator of the Environmental Protection Agency. He was nominated for the post by President Carter on February 16.

Costle is a former commissioner of the Connecticut Department of Environmental Protection, and has been a consultant to E.P.A. on land use policies. He holds an A.B. degree from Harvard University and a J.D. degree from the University of Chicago Law School.

The General Accounting Office has released a copy of a study highly critical of the Occupational Safety and Health Administration and the National Institute of Occupational Safety and Health, the research organization in the Department of Health, Education and Welfare. According to the New York Times, the study points out that although millions of workers are exposed every day to hundreds of substances known to cause cancer and other diseases, final protective procedures have been imposed for only 15 such poisons in the five years the agency has been functioning.

The 116-page report of the G.A.O., the investigative arm of Congress, said that unless the two agencies can expedite the passing of emergency temporary standards, "it will take more than a century to establish needed standards for substances already identified as hazards." The study concluded that some of the $727 million dollars the agencies have spent in the last five years might have been better spent on education and training activities related to toxic substances.

The enforcement procedure of O.S.H.A. were recently upheld by the Supreme Court. In a unanimous decision, the court rejected the arguments of two contractors who alleged the procedures unconstitutional on the grounds that they had been fined without benefit of a jury trial.

Justice Byron R. White, writing the decision of the court, held that the Seventh Amendment to the Constitution providing jury trials in civil suits with penalties of more than $20 does not prevent Congress from establishing other enforcement procedures.

Scientists at Mississippi State Chemical Laboratory are attempting to develop degradable insecticides that could be used to control the imported fire ant under a cooperative agreement with the U.S.D.A.

The red and black imported fire ants, Solenopsid invicta and S. richteri, are serious pests of humans and agricultural production in the southeastern U.S. Since Mirex is being phased out as a control for the imported fire ant, new toxic bait formulations must be developed.

In studies to develop new baits, researchers at Mississippi State will synthesize new candidate chemicals that are readily degradable and have a slow or delayed toxic action.

The Agricultural Research Service of U.S.D.A. will provide $24,000 for the study.

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Nobody but nobody offers such a wide selection of quality poles — in so many types — and colors.

4 proven-popular kinds to choose from! Flex-King, Royaline and Tournament Poles in high-grade, weather-proof fiberglass; Slim Line poles in super-strong, heat-treated aluminum.

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Industry News

GCSAA adopts stricter code

A stronger code of professional ethics and enforcement procedures have been approved by members of the Golf Course Superintendents Association of America.

One of the code's new standards is a requirement that product endorsements be based strictly upon satisfactory personal experience with the item.

In addition, gifts offered by any firm must be made available to all similarly situated superintendents, with the understanding that no actions will be forthcoming as a result of the acceptance of such gifts.

In conjunction with the approval of the new code, GCSAA members approved two bylaw revisions to provide stringent enforcement of it. The enforcement procedures will begin with the Ethics Committee. Upon that committee's recommendation, the Executive Committee can, under the new provisions, enforce the code by disciplining or expelling members who violate it.

IH reorganizes: creates new group

International Harvester has changed its organizational structure from a divisional concept to five free standing, self-sufficient world-wide business groups, according to Brooks McCormick, IH president and chief executive officer.

"After a year-long study by outside consultants, the Board of Directors has approved the recommendations that we create four autonomous world-wide groups to manufacture and market our products — agricultural equipment, trucks, construction equipment and turbo machinery. A new, and the fifth, world-wide group, called the Components Group, will be created with responsibility for manufacturing axles, engines, castings and management of IH's parts distribution system."

Can. seed coating plant planned

Oseco Limited of Bramton, Ontario, and Hodder & Tolley Limited of Palmerston North, New Zealand, have agreed to form a new, joint venture company to build Canada's first seed coating plant at Brampton, Ontario.

Hodder & Tolley is a well established seed firm in New Zealand and has developed a seed coating and inoculating process. Oseco is one of the largest forage and turf seed merchandising firms in Canada.

Tree value slide show available

The newly-formed Council of Tree and Landscape Appraisers has produced a slide-and-tape audio/visual program of trees and landscape values — particularly from the standpoint of dollar losses which may be recaptured when trees and other landscape materials are damaged or destroyed through casualty.

The program, titled "Tree Values," is available for showing at a use fee of $10. It may be purchased outright for $65. Address inquiries to The Council of Tree and Landscape Appraisers, 232 Southern Building, Washington, D.C. 20005.

Scott's, NFFAF sponsor turf award

O. M. Scott & Sons has signed an agreement with the National Future Farmers of America Foundation to sponsor a Turf and Landscape Management Proficiency Award, according to a recent announcement by Le Herron, Jr., company chairman and president.

The award is designed not only to complement classroom training with practical experience, but also to serve as an incentive for both career and leadership development. This Proficiency Award will recognize and reward students excelling in turf and landscape related projects.

The first local awards under the program will be made in Spring 1978 with the initial national award being presented at the FFA National Convention in November 1978.

GCBA membership directory ready

The 1977 Membership Directory of the Golf Course Builders of America is now available without charge from the association's headquarters.

The 44-page, three color booklet features names, pictures and golf course construction experience of the nation's best golf course contractors.

Write to Golf Course Builders of America, 725 15th St., N.W., Washington, D.C., 20005.

CN Rail urges potash consortium

A new method for distribution of potash is being advocated by CN Rail, one of the largest integrated railway systems in North America.

"We're proposing a company made up of potash producers, the two major Canadian railways, and a partner experienced in systems management and truck and barge handling to act as a distribution agent for potash producers," said Peter L. Schwartz, CN national marketing manager for fuels and chemicals.

The proposed company would own and operate a system of warehouses throughout the six corn belt states.

Crabgrass, nutsedge and chickweed don't live here anymore. Thank DACONATE® 6.

Sometimes you need *postemergence* control of crabgrass. You get an outbreak of nutsedge or chickweed. Daconate 6 is the answer.

Daconate 6 is the postemergence herbicide that can be used according to label directions on bluegrass, bermudagrass and zoysiagrass. Controls nutgrass, crabgrass, goosegrass, bahiagrass, chickweed, barnyardgrass, wood sorrel and sandbur.

Just add water. No other additive needed. Daconate 6 is a ready-to-use liquid with 6-lb. per gallon MSMA plus surfactant. A swift, sure end to grassy weed problems.

Diamond Shamrock also offers a complete Turf Care System which gives you almost total protection against fungus diseases and weeds. It is now being used by many of America's leading golf courses.

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People on the Move

Orin R. Smith has been appointed senior vice president of the minerals and chemicals division of Engelhard Minerals & Chemicals Corp., Menlo Park, N. J.

Smith was formerly affiliated with M & T Chemicals. He holds a B.A. in economics from Brown University and an M.B.A. in management/marketing from Seton Hall University.

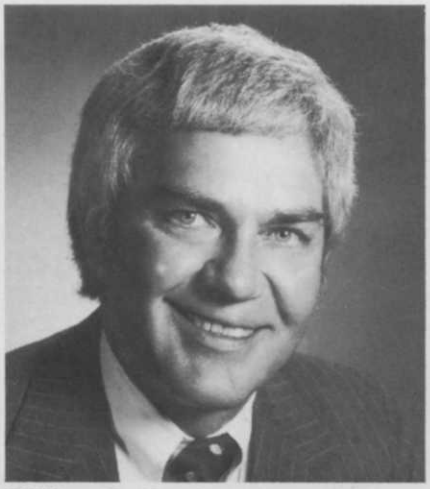
The appointment of **Dennis Kirven** as product manager has been announced by W. R. Grace & Co. Horticultural Products, Cambridge, Ma. Kirven holds B.S. and M.S. degrees in agriculture from Ohio State University. For the past 14 years he was county extension agent on the staff of Ohio State University.

Richard A. Gore has been appointed southern regional sales manager for the trade division of the Harvest Publishing Co. Gore is based in Atlanta, where he serves the southeast and south central regions of the U.S. He holds a B.A. in business administration from the University of Alabama.

Diamond Shamrock's agricultural chemicals division named **Jerry L. Pauley** mid-western region's agricultural chemical sales specialist. He will be responsible for sales and service of the division's products in Illinois, Missouri and Iowa.

Pauley's experience includes positions as assistant manager for Williamsdale Nursery in Columbia, Mo. and as a research technician for the University of Missouri. He holds a B.S. in horticulture from the University of Missouri.

Newly elected officers of the National Landscape Association are: **Dale K. Manbeck,** Manbeck Nurseries, Inc., New Knoxville, Ohio, president; **Frank Tomlinson,** Tomlinson's Select Nurseries, Whittier, Calif., vice president; and **Richard L. Ammon,** Ammon Garden Center & Landscaping, Inc., Florence, Ky., secretary-treasurer.



William D. Brooks

Marcus Colloton

Dennis M. Kirven

Bill Amick, Daytona Beach, is the new president of the American Society of Golf Course Architects. Amick, who established his own firm in 1959, has designed many leading municipal and real estate development golf courses in Florida.

Other newly elected officers include: **Rees L. Jones,** Montclair, N. J., vice president; **Jack Kidwell,** Columbus, Ohio, secretary; and **Dick Phelps,** Evergreen, Colo., treasurer.

Winner of the Society's second annual Donald Ross Award was **Herbert Warren Wind,** author of numerous golf reporting books.

William D. Brooks, has been promoted to director, marketing planning-agricultural marketing services and planning for Elanco Products Co. He has been serving as manager of national accounts — animal products since July 1976.

Brooks, who holds a degree in business administration from Hastings College, joined the company in 1968 as a marketing associate for agricultural chemicals.

Marcus Colloton has been appointed chief engineer for Bluebird International. Colloton, who has over 20 years of experience in the design and management of products in machine tooling, agricultural tractors, and lawn and garden industries, came to Bluebird from AMF Lawn & Garden, Des Moines, where he was project engineer for rotary lawn mowers.

Colloton is a graduate of Dunwoody Industrial Institute, Minneapolis, and has studied at the Universities of Minnesota and Wisconsin, and at the Milwaukee School of Engineering.

At the working end, John Deere has the competitive edge

With utility tractors, getting work done is more than a matter of horsepower. The difference lies in how easy it is to get the work done. That's where John Deere Tractors in 43-, 50-, and 62-horsepower sizes invite comparison.

The 3-point hitch on all John Deere utility tractors and loaders has features not available from competition, including a Load-and-Depth Control system with easy-to-operate single-lever control quadrant; one set of sway blocks that handle Category 1 or 2 attachments in any position; and vertical float for gauge-wheel-equipped tools. You can even mount a backhoe without rockshaft interference.

Whether you're mowing, seeding, spraying, landscaping, etc., John Deere's 3-point hitch system can help get the work done more efficiently. Your local dealer can give you a complete list of features and equipment available on John Deere utility tractors and loaders. John Deere, Moline, Illinois 61265.

Draft links can be one-piece or telescoping. They are easily adjusted and the leveling crank can be locked.

JOHN DEERE

JOHN DEERE on the move

Excavation and the planting of large trees helped bring a character to the Villas at Park Aire that has brought numerous landscape awards to the contractor.

LANDSCAPING THE MULTI-FAMILY COMPLEX

Turning an abandoned airstrip into a showplace of turf, trees and shrubs is an exhilarating experience, says Jim Gibbs, president of Green Bros. Landscaping Co., Inc., in Smyrna, Georgia.

Gibbs ought to know, for it was his company that helped transform the old Parkaire airport in Cobbs County, Georgia, into the Villas at Park Aire, a condominium complex that has brought Gibbs several landscaping awards, including the Grand National Landscape Contractors Award and an award of merit from the National Landscape Association.

The Villas at Park Aire is one of a series of four condominium complexes slated for the old airport property. The villa site is approximately 12 acres along an entrance boulevard developed for the four villages.

"The Villas at Park Aire presented a challenge to everyone concerned from its inception," said Gibbs. "The site is on the runway and plane storage area of the old airport and thus virtually flat. Using four building types, two of which are one story, a unit density of ten units per acre was achieved. This represented an extraordinarily high land coverage for a project of this type," he added.

"From the very beginning," said Gibbs, "the developers knew it would take a lot of imagination and ingenuity on the part of the architect, landscape architect and landscape contractor. Careful selection was made as to qualified firms that would be able to work together and coordinate all of the expected and unexpected problems that could arise."

Gibbs said the challenge was clear. In order to market and sell the condominiums, the team would have to create a look of lushness for the abandoned airport, and they would do this by creating a surrounding of low valley and mounded hills planted with large trees and shrubs. "Only with the creation of a newly planned and planted environment would the developer be able to offer what they felt the public was looking for in today's market."

Because of the complexity of the project and an awareness that all phases of this development would require special co-ordination, a carefully developed set of plans was prepared at a scale of one inch equals eight inches. This package included grading, staking, co-ordination of utilities (underground) and the planting plans.

The first step was to add interest to the flat and mostly asphalt covered site with regrading. This provided as much as 12 feet of vertical change within some of the courtyards between the buildings. Gibbs used retaining walls and large grass mound to break up the new spaces into more personal units.

A wide pallet of plant materials was selected for this project designed by Planners & Engineers of Atlanta. "Lacking any natural trees, it was important to bring in as many large trees as possible to offset the mass of wooded buildings and paved areas, to provide shade, and to give the complex an established feeling," explained Gibbs.

Specimen crepe myrtle, cederus deodara, pampas grass and multi-trunk clumps of river birch were used for impact and interest at important locations.

A strong emphasis was placed on evergreen material throughout the project to provide a year-round feeling of lushness. Potted plants were brought in to break up the paved surfaces. "They are softer to the eye and create a more relaxed atmosphere," emphasized Gibbs. Hanging baskets were added for color along with wisteria covered arbors.

Overall Gibbs thoroughly enjoyed the project. "What you are involved with in landscaping are areas," he said. "And when you have large areas, as with a condominium complex, you have to think in terms of smaller areas within the large ones to really landscape nicely.

"What's nice about the condominium challenge is that you can get into smaller areas more easily. You can use a lot of different plant materials too which makes the job more interesting."

Jim is particularly proud of the Villas because of its many levels of interest. "We mounded areas on the sides of the drives which create the effect of the drives being set in six feet lower than the surrounding areas," he said. In the pool area alone there are 12 feet of vertical change.

Perhaps the most outstanding aspect of the Villas is its feeling of establishment and character

brought about by the planting of older, larger trees. "We couldn't plant six foot trees and wait ten years for them to grow" said Gibbs, "The project had to be sold soon." A 75-foot crepe myrtle was placed in a very prominent position near the pool with the help of a crane. The river birch were 25 feet tall, magnolias 20 and 25 foot.

This was accomplished despite a three-month delay in construction. "We had planned this job to be planted in April," Gibbs said. "But it worked out we were planting during the summer months which meant we had to move all of the plantings in full leaf."

To prevent loss, which amounted to less than three percent, bigger balls of earth were dug. The 35- to 40-foot cederas deodara placed at the entrance were dug in the summer months and moved right in. But many of the other plantings were brought in ahead of schedule to an on location storage area.

An automatic sprinkler system was installed to keep the plants healthy for the months they were stored. "We started bringing in trees and shrubs as early as March," said Gibbs. "We would keep them misted until they were planted." Planting began in June and continued through August.

The on location "nursery" permitted better co-ordination with the construction. "As with most jobs," explained Gibbs, "someone would say, listen, in three weeks I want you to go in and do that area. But in three weeks they just didn't have the area ready. With the storage area, we were able to move into an open area quickly."

Gibbs also helped speed the project by having two five-men crews on call. They would assist the five-man crew on the job continuously when a large area would open up.

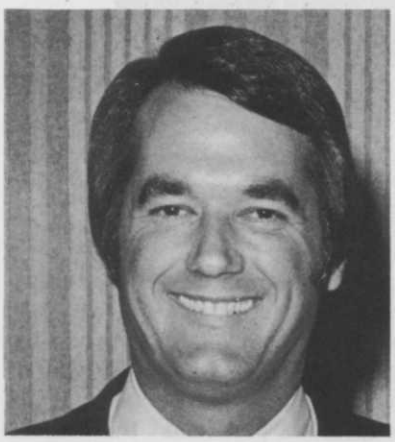
Gibbs attributes the success of the Villas at Park Aire to co-ordination and co-operation. "Our company was involved with the project from its inception," he said. "We worked very closely with the architect and landscape designers. We also worked closely with our growers. When we bought the plants we had to make sure they were going to be shipped on time. Then we had to unload them and store them properly. In the meantime we co-ordinated our crews on site."

This co-ordination helped overcome problems with underground utilities, walkways that didn't turn out as planned and drainage. Drainage, he emphasized, was a big factor. "You've got to have good drainage for a successful project."

Gibbs sees a bright future for multi-family complexes but only if the total package is one of quality. "So many people, the wrong people, decided to build condominiums because it was the thing to do," he said. "They threw them up with little concern to quality in construction or landscaping. But people got smart. Now they look for quality.

"People are just more conscious of the environment and environmental improvement today. They really don't know what's inside the walls, but they can recognize good quality landscaping. They are looking for it and are willing to pay the price." □

Portrait of a winner



Jim H. Gibbs Jr., president of Green Bros. Landscape Co., Inc., is an affable young man with a zest for his work that is rare these days.

Gibbs, who holds 36 landscape awards, came to Atlanta in 1966 following graduation from the University of Georgia where he received a degree in horticulture and completed three years toward a degree in landscape architecture.

"I started out in business administration," he recalls, "but I just didn't like it. I wanted to do something more creative." Gibbs studied both horticulture and landscape architecture because he wanted "to be more involved with the installation yet have a design-built company."

When he began with Green Bros. in 1966, the company had six nurseries. Today it has 18. He began the landscape company working out of one of the nurseries then later moved the company to its present five and one half acre site in Smyrna. His staff includes designers, landscape architects and four five-man crews.

Gibbs' theory of management is simple. Get the best man for the job from your own ranks. "People who work as foremen for other companies sometimes aren't willing to make the changes," he explains. "We've found our best foremen come out of the ranks. They start out knowing how to plant properly, how to do the job the way we want it done."

Although Gibbs holds education in high regard, he puts more emphasis on talent and attitude. "If you've got talent and are willing to work then that's it."

Gibbs believes too many people today are out solely for themselves. "They think what can I get out of the company instead of what can I put into it. They figure everything out to an hourly wage. We don't keep these type of people very long.

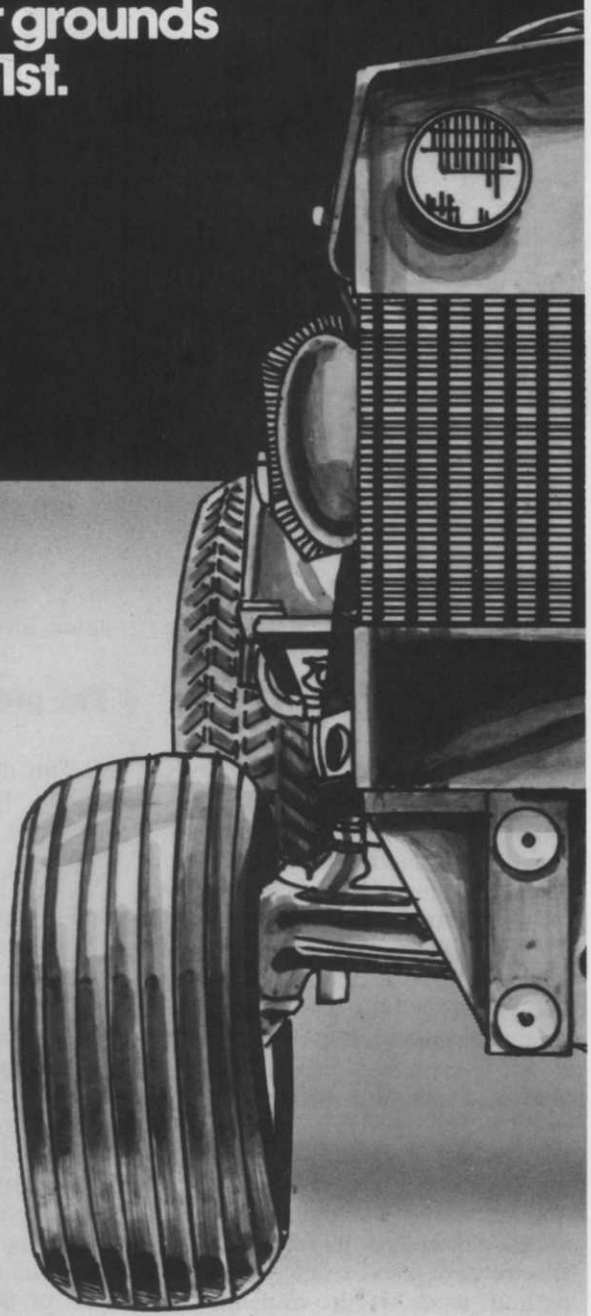
"If only more people would realize that if they thought more about the company, the company would prosper and reward them."

For Jim Gibbs and the Green Bros. Landscaping Co., this theory has worked very well.

Gibbs is married and the father of three children.

We'll give you a free 60" mower

valued at over $500 if you put this Wheel Horse® D-250 to work on your grounds by May 31st.



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What's so special about the D-250?

Wheel Horse is the first to put automotive engineering to work on today's lawn and garden problems. Its 4-cylinder liquid cooled engine makes the D-250 dramatically strong. Yet amazingly quiet. Add to this its compactness and maneuverability and you've got the professional lawnskeeper's professional tractor.

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Valid only at participating dealers.

Please send me a copy of your 1977 Catalog and tell me more about your special free mower offer. Also, I'd like to know the name and address of a Wheel Horse dealer near me.

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HYDRO-MULCHING AS AN ALTERNATIVE

by Jim Lincoln

Hydro-mulching may be one of the fastest growing segments of the landscape industry. Landscape contractors are finding that the problems of grass establishment on projects of almost any size can be turned into significant profit centers by using hydro-mulching as an alternative to seeding or sodding.

For the landscape contractor, the establishment of turf cost money and takes time. Laying solid sod usually costs the most and provides excellent survival and coverage the moment it is laid, assuming it is watered properly. The broadcasting of seed on unprepared surfaces usually costs the least but the amount of turf ultimately established is highly uncertain and the time required for coverage may be unacceptable. The budget for turf establishment and the time required for coverage usually determines the method used. Hydro-mulching is emerging as a desirable alternative providing low costs and good results.

Hydro-mulching is a process of rapid grass planting whereby a mixture of wood cellulose fiber, seed or sprigs, water and fertilizer are prepared in a Hydro-Mulch machine.

The process

This mixture is sprayed onto the ground through a high pressure pump to form a mat of material similar in appearance to green paper maché. The material resists erosion, retains moisture, and enhances initial growth. The fiber decomposes over a period of time, organically enriching the soil.

In comparing typical seeding to hydro-mulching, if soil and moisture conditions are similar, hydro-mulching yields a substantially better stand of grass than seeding. Where spot sodding is frequently used in a particular locale, hydro-mulching, if watered heavily, provides full coverage of grass in a fraction of the time required for spot sodding and provides much better erosion and weed control. Spot sodding requires less watering care to survive but requires substantially more time and labor for installation. Also, spot sodding is limited to spreading grasses.

Actual direct costs for installation are somewhat similar. Hydro-mulching, when compared to total sodding, is done on an equivalent area in a fraction of the costs, time, labor and materials. Even considering the probability of additional irrigation costs with hydro-mulching, sodding is considerably more expensive. Also, hydro-mulching is virtually weed free and yields a smoother turf, all other factors being equal.

A two man crew can apply the mulch mixture effectively with only a few hours training. Time required to do a job depends on the size of the job, the type of grass used, the source and location of water required for filling the machine, and the size of the machine used. An efficient two man crew with an 800 gallon Bowie Hydro-Mulcher, in an easy eight hour day can do about five normal size home lawns, or one 40,000-60,000 square foot apartment complex, or up to 100,000 square feet of football field or similar open area. These production times are based on averages

Hydro-mulch mixture is sprayed onto the ground with a high pressure pump to form a mat similar in appearance to paper maché.

of actual experiences and reflect the use of heavy applications of materials.

Variables influencing success

Results depend on temperature, moisture, and soil. Temperature and moisture are the factors which promote quickest seed germination. Seed-bed conditions determine growth rates after germination. During the ideal months for planting, with proper watering, hydro-mulched turf will require mowing and have excellent coverage in about three weeks. A football field can be made ready for play in 60 days with durable turf. During less desirable planting times, a good stand of grass will take more time to become established.

Without adequate irrigation, the establishment time and coverage varies substantially. Hydro-mulching provides a micro-environment which enhances quick seed

Continued on page 20

First Year Income Statement

With surveys, questionnaires, and financial analysis of the hydro-mulching contractors, the following income statement represents dollars and percentages which might be experienced the first year by an efficient operator and good businessman.

100%	Sales		**$50,000**
60%	36% All Labor & Salaries 24% All Materials	18,000 12,000	**30,000**
30%	Rent, Depreciation, Gas & Oil Insurance, Repairs & Maintenance Legal &Professional, Advertising Tools & Supplies, Phone, Office Exp. Bad Debts, Other		**15,000**
90%	Total Expenses		**45,000**
10%	Net Profit Before Tax		**5,000**

The investment in a Hydro-Mulch machine, truck, miscellaneous items and start-up cost will not exceed $15,000.

33% Return on Investment (before income tax)

$\frac{\$\ 5{,}000 \text{ Profit}}{15{,}000 \text{ Investment}} = 33\%$ Return on Investment

germination and holds the seed in place so that the coverage is uniform. Uniformity is extremely important with many of the cool season grasses.

The hydro-mulching process doesn't work automatically. Any planting requires water, either irrigation or rainfall. The hydro-mulch material is a water retaining agent which makes this process far more effective than ordinary seeding. Even so, poor growth due to lack of water, especially in the extreme heat of the summer, is by far the greatest and most difficult problem encountered in hydro-mulching. A hydro-mulching contractor must base his guarantee of results on anticipated irrigation or rainfall.

The hydro-mulch material is an erosion preventative but erosion caused by heavy rains can occur, especially if water run-off from a higher point flows over the hydro-mulched area. Sometimes, a hydro-mulching contractor will use a small amount of staked down sod in a small heavy run-off area to insure 100 percent coverage of grass. When complete coverage is required, a contractor must anticipate potential touch up work and figure that into costs.

Costs of hydro-mulching will vary significantly. Labor cost of a particular job will depend on the size of the job, the location of the job, the nearby availability of water, and the type of job. Open areas, such as parks, can be sprayed more quickly since over-spraying is not really a concern. Home lawns and apartments must be more delicately sprayed to avoid getting material where it is not wanted.

Since grass seed is planted at different rates and the price of seed varies significantly, this portion of the materials costs generally ranges from $1.00 to $5.00 per 1000 square feet. Mulch costs will range from $5.00 to $9.00 per 1000 square feet depending on the quantity purchased, the type of mulch used, and the transportation cost related to the mulch. One of the more expensive mulches, Conwed "2000," is becoming quite popular because of its erosion resistant quality. The flow ability of "2000" also permits more mulch to be used per tankload. More mulch per tankload can lower labor costs somewhat offsetting the higher cost of the mulch. Also, less erosion can save touch-up costs.

Fertilizer costs usually range from $1.50 to $2.50 per 1000 square feet, but also can be affected by the related transportation.

As more landscape architects specify hydro-mulching for larger projects, marketing the process is becoming unnecessary. In parts of the country where the process is unknown, selling the first job can be a problem. After a few jobs have been successfully completed, then the contractor with a Hydro-Mulcher can anticipate many calls. Selling the process of hydro-mulching to the next customer is then quite easy.

Job failures are almost always related to lack of watering.

Selling problems can arise when a job failure occurs. Job failures are almost always related to lack of watering. To get proper watering, the contractor must supervise the first or second watering and then follow up to make sure his instructions are being carried out. Very specific written watering instructions are a helpful aid in communicating the importance of proper watering to the customer. If this most significant watering routine is followed out with the customer, the public relations aspect of dealing with people is well taken care of.

Marketing: A cost-benefits model

Internal problems occur within a hydro-mulching operation when personnel time is not well budgeted. Selling takes time. Watering instructions and follow-up takes time. Answering the customers phone-in questions takes time. The customer now knows an "expert" he can call if he has grass problems in the future. He calls the person who put it in. The total of these time requirements can ultimately be as much as ten (10) man hours per job.

The direct cost pointed out earlier must be combined with the "advisory time" cost to determine costs of each job. If a very small job is done at a price of $150.00, labor and materials (including touch-up) might cost $60.00. If the typical customer contact is involved, the contractor has lost money. A job of 3000 sq. ft. (333 sq. yds.) priced at $180.00 (6¢ per sq. ft.) is questionable in terms of profitability. A job of 5000 sq. ft. (555 sq. yds.) priced at $300.00 (6¢ per sq. ft.) yields a handsome profit.

Growth seems certain

Typically, new construction areas have the greatest need for new grasses and provide the largest single market for hydro-mulching. With a slight upsurge in housing starts projected for this year, and a favorable prognosis for the construction trades by most indicators, hydro-mulch contractors ought to be picking up substantial amounts of business. As industrial parks outside of central cities continue to crop up and many industries continue to relocate from central cities, further markets will be generated for hydro-mulching in the landscape industry.

If contractors can study the trends in building and anticipate new construction and the need for grasses on these sites, marketing hydro-mulch technology and securing contracts can be made simpler.

Thus, with sound planning and financial realism, careful assessment of field conditions, tenacious marketing strategies and creative, positive thinking, rapid growth in the hydro-mulching industry can be assured. □

Jim Lincoln is the founder of Southwest Hydro-Mulchers Distributing Co., Dallas, Texas.

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REFLECTIONS ON FUSARIUM BLIGHT

By Dr. Richard W. Smiley

Fusarium blight on Kentucky bluegrasses results from the growth of these grasses under stress. The disease will continue to disfigure bluegrass stands as long as those grasses are grown under cultural and environmental conditions to which they are not well-adapted. Long-range disease control, therefore, is dependent upon removal of that stress, either through changes in the cultural management procedures, or through use of other varieties or other species that are better adapted for growth under current management and environmental regimes.

Various opinions on the causes of Fusarium blight have arisen, and some research results have differed. Opposing viewpoints arise because the precise causal reason for the development of Fusarium blight probably varies on every different bluegrass stand, and on different areas

within the stand. For example, thatch accumulations may be the primary stress factor in one area, low pH in another, drought in another, combinations of these in other areas, and so on.

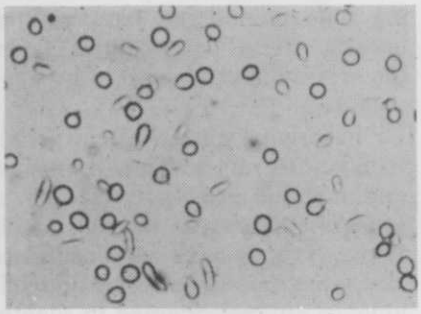
The overall health of any turfgrass stand depends upon the balance which exists among the disease components — which are host plants, pathogens, and the environment. Each of these primary components are in turn comprised of a multitude of subcomponents. As the balances among the subcomponents are altered, an infinite number of gradations from severe disease to no disease may result. Long-term and stable control of Fusarium blight, therefore, depends upon the establishment of a turfgrass community where the pathogen's activity is restricted by as many subcomponents as is possible. A brief discussion of the more important variables may help you to find additional approaches for controlling this disease on your turfgrass.

The pathogens

Fusaria are among the most widely distributed fungi on earth, and they can be isolated from nearly all turfgrasses, soils and thatch, even though the turfgrasses remain healthy. Fusaria, including Fusarium tricinctum and various species of the F. roseum type, are a normal and necessary component of the soil and thatch microflora. These omnipresent soil fungi aid in thatch decomposition, recycling of nutrients, parasitism of other fungi (including pathogens) and insects, and other desirable phenomena. Widespread distribution of the fusaria occurs when mycelial fragments or spores are moved by the wind, on seed, on sod, on other wind-blown crop debris or soil, by water, by man and animals, and by other means.

Fusaria frequently inhabit underground tissues of turfgrass plants, but only become weakly pathogenic and cause disease if plant growth becomes impaired. They cause little or no harm if the environment is favorable for growth of the host and of the general microflora. Since these fungi are very frequently found in and on normal turfgrasses, a manager should not be surprised to find them listed among the fungi isolated from healthy or diseased turfgrasses. It should also be recognized that reductions in their numbers through the use of fungicides are very temporary, at best.

Frequent applications of fungicides to repeatedly reduce the numbers of any common soil organism in any perennial crop involves a costly and often unnecessary program that is likely to fail after prolonged use. It is also important to recognize that fungicides simply offer a short-term relief of symptoms, and not a long-term solution to the problem.



Dispersal and survival of Fusarium is by spores and hyphae.

Photomicrograph of the macroconidia, the asexual fungus spore.

Fusarium blight on Merion fairway.

The hosts

If the fusaria have been part of the normal microbiological equilibrium of sod for centuries, why has Fusarium blight been known to turfgrass managers for only about 16 years, and why does it continue to increase in importance. Answers to these questions are not easy, but they probably relate to the widespread introduction of Kentucky bluegrass selections for use as monocultures in the early 1950's.

The full acceptance of Kentucky bluegrasses was roughly coincidental with the discovery of Fusarium blight, which suggests that this host and its cultural and chemical management are more responsible for the disease than is the pathogen. Thus it is not surprising that the disease incidence and severity are

generally greatest where the management of these grasses is most intense.

Kentucky bluegrass varieties differ greatly in susceptibility to Fusarium blight in the field, but all appear to be susceptible, to attack by the fusaria if they are grown under highly adverse conditions, and in artificial soil and microbial environments in the greenhouse. Fusarium blight thus appears to be a possibility in older stands wherever a manager is attempting to use a variety in an area where it is not well-adapted to the existing environmental stresses, or is attempting to use in environmentally marginal areas a resistant variety under management procedures for which the variety is not well-adapted.

Those varieties that are only moderately susceptible in the field may perform very well in areas where there is moderate disease pressure, but would not be recommended as highly as the most resistant varieties in areas where Fusarium blight occurs often. Since many different species and strains of fusaria are associated with Fusarium blight, resistance is based more upon environmental tolerances of the host than upon an incompatibility between specific Fusarium isolates and the host variety. Resist varieties are, therefore able to withstand drought, temperature or other stresses better than susceptible varieties in the selection nurseries and other test areas.

The environment

The environment is the most important factor affecting the growth capabilities of hosts and of pathogens. The environment is very complex since it consists of interdependent biotic and abiotic subcomponents, which in turn have many interdependent factors of their own.

Abiotic factors include air temperature and humidity, mowing, pesticides, soil moisture, soil fertility, soil compaction, soil acidity and many others. Biotic factors include the microorganisms on soil, thatch and leaves, the vegetative thatch components, insects and mites, nematodes and even smaller soil animals, and so on. But single environmental factors are probably never solely responsible for predisposing plants to Fusarium blight.

Interactions among factors are of greater importance than individual factors since a change in any specific factor may cause a change in many others until a new balance is achieved. That balance may or may not predispose the plant to disease development. Several examples of this complexity and their effect on turfgrass follow.

Nitrogen concentrations which are most favorable to turfgrass growth differ for each variety and its intensity of management. Excessive nitrogen, or its imbalance with other mineral elements, may increase the attraction of the fusaria to plant tissues and exudates (shoot and root), may increase the shoot-to-root ratio such that the rate of water depletion is accelerated, and may increase the rate of thatch accumulation by increasing the rate of vegetative growth more so than that of microbial decomposition of organic debris.

Excess nitrogen also reduces the plant's heat tolerance, the pH of thatch or soil, and the carbon-to-nitrogen ratio of thatch. All of these responses to excessive nitrogen favor mycelial growth and/or germination of dormant spores of Fusarium, and favor stimulated growth of the mycelium which has been relatively inactive inside the crowns of apparently healthy plants.

Optimal temperatures for many fusaria are above the optima for many Kentucky bluegrasses. High temperature stress may result in reduced growth, accelerated root maturation, and inhibition of enzymatic activity. The latter may cause shifts in nitrogen components from molecules that are structurally bound to those that are in the plant sap and the exudates of roots and leaves.

Fusarium blight is generally absent during cool to moderate temperatures.

Pathogenesis is favored by an increase in the nitrogen content of plant fluids. Heat hardiness is reduced by sudden drought, excessive nitrogen, acidic soils, and close mowing. Fusarium blight severity increases as the root temperature increases. Soil on south slopes may be considerably warmer than on north slopes, and the rate and magnitude of temperature changes are greatest on the drier soils.

Leaf temperatures may be much higher than air temperatures, and midday syringing is useful for reducing that leaf temperature. It is interesting also that these same fusaria can grow even at near-freezing temperatures, and can contribute to winter disease which is normally caused by Fusarium nivale. Fusarium blight is generally absent during cool to moderate temperatures because those temperatures favor the maximum expression of host resistance.

Fusarium spores often germinate best in very acid environments, and mycelial growth is favored in moderately acid to neutral conditions. The Kentucky bluegrasses and many microorganisms and soil animals are best adapted to slightly acid to neutral environments, and it is in this range that the host is best able to resist disease.

Gradients of pH occur in soils, and in the eastern United States, thatch is often more acidic than the underlying soil. Acidic thatch and soils impede nitrogen transformations, thatch decomposition, and other processes.

Fusarium blight is often first found on the driest sites because, unlike many fungi, the fusaria are adapted to growth in dry environments, while their Kentucky bluegrass host and most microorganisms are adapted to moist environments. Fusarium numbers are often greater in cyclically wetted and dried areas than in continually moist areas because the pathogen is attacked continually by other microorgan-

isms in moist environments, and only periodically attacked where moisture levels fluctuate greatly. The pathogen also sporulates profusely as nutrients are released during the rewetting of dried thatch.

Fusarium blight is sometimes favored by the use of pesticides: 1) which accelerate thatch accumulation by inhibiting the activity of thatch — decomposing microorganisms; 2) which inhibit nitrification and other mineral transformation processes; 3) which suppress activities of microorganisms that are antagonistic toward or competitive with the pathogenic fusaria; and 4) which weaken the plant. Much more disease is likely to be found, for instance, on Kentucky bluegrasses where any suppressor of Poa annua has been used.

Each pesticide differs in its potential side effects, and the magnitude of side effects are frequently dependent upon other environmental variables. Since many pesticides have no observable side effects at all, it is wise to keep abreast of the latest information to identify those that do.

Keen competition exists among all organisms for food resources, and so it is with the microorganisms in the soil and thatch. Maintaining a microbial balance that favors the host and is unfavorable to pathogenic fusaria is extremely important because unintentional limitations imposed on primary competitors of pathogens could lead to pathogen multiplication and then severe disease. We need to utilize these competitive or antagonistic microorganisms, these natural biological control mechanisms, to help restrict the activity of pathogens.

Each pathogenic fungus is affected by different groups of microbial competitors and antagonists and each of these groups may in turn be affected by different levels or types of environmental factors, and by different pesticides. Fungicides vary widely in their toxicities to different groups of nontarget organisms as well as to pathogens. The use of a specific pesticide in the spring can, for example adversely affect components of the microflora other than the target pathogen. If those other nontarget microorganisms are strong competitors or antagonists of pathogens which cause diseases in the summer, and if the spring-applied fungicide is ineffective against the summer pathogens, then that early pesticide application would increase the tendency for development of summer diseases. The overall efficiency of the pest management program would have been favored by the selection of a fungicide in the spring which did not affect antagonists of the pathogens which cause summer diseases. When one views turfgrass culture with these thoughts in mind, it is not uncommon to observe trends for more severe disease outbreaks where certain chemicals have been used earlier. Research on the effects of commonly-used fungicides on the microflora components of turfgrasses is badly needed.

Fusarium blight will never be controlled in all areas because the plant's resistance is relative.

Disease control

The first priority in any long-term plant disease control program is to choose the species and varieties that are best adapted to the area and to the management conditions under which they will be grown. Several varieties with good resistance are now available and should be used in sodding, reseeding, and overseeding programs in Fusarium blight-prone areas. The very latest precise information about varieties, their adaptation, and their culture will come from attandance at conferences, from extension personnel, and from other specific papers in trade and technical journals. The best overall compilation of philosophies and research on Fusarium control was presented at the 1975 Illinois Turfgrass Conference. Those proceedings were published in Weeds Trees & Turf (July, 1976), and reprints are available.

It is my opinion that Fusarium blight will never be controlled in all areas because the plant's resistance is a relative factor which depends upon the type and the amount of stress present.

Newly introduced, highly efficient Fusarium blight-resistant varieties will probably be used even further south than is possible with older varieties, and these new varieties will then also be subjected to stresses for which they are not adapted. These future abuses of newly introduced varieties are predictable.

Turfgrass managers should remember that changes in turfgrass genera rather than varieties are a readily available means for achieving the overall goal of suppressing Fusarium blight. Grasses that appear to resist Fusarium blight in the field include bermudagrass, zoysiagrass, creeping bentgrass, and perennial ryegrass.

The second priority in long-term disease control programming is to utilize the best management procedures for the variety being grown. Even the most resistant variety can be predisposed to disease by adverse management. Likewise, the successful culture of any given variety can be extended further into hostile climatic regions if given the best possible management. Although it is beyond the scope of this paper to discuss details of these general approaches, some guidelines will be given.

Primary stresses which influence disease development on Kentucky bluegrasses include excesses of soil acidity, thatch, fertilizer, humidity, turf canopy temperature, and nematodes, as well as drought, low mowing height, incorrect timing of fertilizer applications, and use of certain pesticides. Excess soil acidity should be corrected by liming to maintain a pH of above 6.2. Light, frequent applications may be preferable where thatch rapidly becomes acidic due to high amounts of rainfall or irrigation.

Thatch should generally not ex-

Continued on page 28

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

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

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ceed a depth of one-half inch, and it should not require mechanical removal if other environmental factors are favorable.

Well balanced fertility is essential for production of healthy turfgrass plants, and excesses of nitrogen should be avoided. Fertilizer applications should not be made shortly before or during the midsummer heat and drought stress period.

Deep, infrequent watering is essential for proper root growth. Shallow roots which result from light, frequent irrigations are highly susceptible to high heat and drought, but supplemental "syringes" just before the hottest part of the day can reduce leaf and surface temperatures and thus offset the full detriment of excess radiant heat buildup in leaf blades. In that nematodes can reduce the efficiency of roots, excess numbers should be controlled if research in your area indicates that they are contributing to the disease.

Areas of increased humidity due to poor air circulation also have a higher incidence of the disease. Proneness to Fusarium blight is increased in some varieties as the cutting height is reduced. Varieties differ in their tolerance to low mowing, and should be selected according to your specific management program. A variety that is very susceptible to the disease on golf course fairways may be highly resistant in the roughs and on institutional and residential sites.

Pesticides that weaken the plant, or that otherwise reverse the general overall goals of your management program can increase the incidence of diseases, such as Fusarium blight. Specific pesticides that have contributed to this disease include tricalcium arsenate and chlordane. Several fungicides are also suspected of being in this category, but since reasonably clear evidence is lacking at this time, names cannot be mentioned.

Where varietal and cultural controls remain ineffective, the turfgrass manager must utilize chemical controls until the causal stresses of Fusarium blight are overcome. A balance exists here also. As the proneness of turfgrasses to Fusarium blight is progressively increased, either through the use of varieties that are very susceptible to disease in your area or through adverse cultural management, increasing amounts of chemical fungicide will be required to effect satisfactory control.

As turfgrasses become extremely susceptible to the disease, it is possible that no chemical can provide adequate protection. Conversely, as the management becomes more favorable, less fungicide will be needed for disease control and, at some point, the application of any fungicide will become unwarranted.

Pesticide manufacturers and research personnel are in agreement that attempts at chemical control alone will be far less effective than if these attempts are coordinated with other control approaches.

Currently-registered fungicides that are effective against Fusarium blight all belong to the systemic benzimidazole class (benomyl, thiophanate-methyl, and thiophanate-ethyl). It is recommended that the fungicides be drenched thoroughly into the root zone so that they may be absorbed through the roots, and translocated systemically upward through the crown and leaf tissues to provide overall protection of the plant. These fungicides do not move significantly downward within the plant and, therefore, foliar applications will not adequately protect the root and crown tissues.

The benzimidazole fungicides are tightly bound to organic matter, and if they are allowed to dry, even briefly, onto leaf surfaces and thatch, subsequent drenches with water will be ineffective in moving the fungicide to the root zone. If rapid drenching is a problem, such as on warm days or where water is in limited supply, it is helpful to make the drenching applications early in the morning while dew is on the grass, or in the rain. Since aboveground symptoms of Fusarium blight develop only after extensive deterioration of roots and crowns, it is imperative that the first fungicide drench be made before these symptoms appear.

At least one follow-up application 10 to 14 days after the first application is recommended. Specific recommendations are available from your local cooperative extension personnel and from university turfgrass specialists.

Statements are sometimes made that the benzimidazoles are ineffective in controlling Fusarium blight at some locations. Diseased tissue can be sent to a laboratory to determine whether benzimidazole-tolerant fusaria are present, but most laboratory studies currently indicate that any lack of chemical control must be attributed to some other reason, such as improper timing, rates or methods of fungicide application, or such as adverse cultural management procedures and susceptible varieties which lead to conditions of excessive disease-proneness that cannot be overcome by even the best fungicide application procedures. Tolerance of the causal fusaria to the benzimidazole fungicides is seldom responsible for lack of effective Fusarium blight control.

I am aware of only a few locations where benzimidazole-tolerant strains of Fusarium have been experimentally demonstrated, and research personnel are developing other fungicides to cope with this problem. Promising new fungicides such as hydantoin (Rhodia, Inc.), fenarimol (Eli Lilly, Inc.), and bayleton (Chemagro Div., Mobay Chemical Corp.), and their effect on Fusarium blight in New York are shown in the photographs. The use of newly-discovered fungicides in rotation or in combination with the benzimidazoles would also lessen the tendency for tolerances to develop where the benzimidazoles are currently highly effective. □

Dr. Richard W. Smiley is assistant professor and turfgrass Pathologist at New York State College of Agriculture and Life Sciences at Cornell University.

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TOPDRESSING WITH SAND

by Dr. Douglas Hawes

Topdressing with sand versus none and summer versus winter fertilization are four management tools I am presently studying in an attempt to learn how to grow combination cool and warm season turfgrass combinations in the transition zone. I am attempting to grow these combinations for use on tees, athletic facilities, fairways and home lawns. In this study, topdressing with sand has greatly benefitted Penncross creeping bentgrass. At the same time Kentucky bluegrass, a blend of five varieties, has done better where it was not topdressed.

Topdressing was first applied in early summer of 1974. In 1975 and 1976 applications were made in late spring, mid-summer and early fall. The sand used has 89% of its size distribution between 0.1 and 1.0 mm. Each application consists of just under ⅛ inch. It is brushed and watered into the turf. The turf is maintained at ¾ of an inch from late spring till early fall. Height of cut is maintained at one inch after the fall topdressing till late spring.

The first noticeable benefit of topdressing was in the fall of 1975. During August, 1975, the bentgrass had been almost eliminated by chinch bugs, brown patch and drought. When the warm season grasses turned brown after the first hard frost it became very clear that the bentgrass was in much better shape where it had received topdressing. Similar data, but without clear differences, were obtained this fall.

On the topdressed half of these plots less winter annual weeds, lower severity of spring dead spot on bermuda, and a lower percentage of dead areas due to insect, drought and disease damage have been observed. Thus the quality of turf was found to be significantly better on topdressed plots in July and November of 1975 and in February, April, June and July of 1976. Thatch accumulation appears to be less in the topdressed plots. However, thatch has not yet become a problem, and thatch measurements have not been made yet.

Some layering of sand and organic matter has been observed. The layering does not appear to be creating a problem. Lighter, more frequent applications would eliminate this layering. Lighter applications would also be easier to work into the turf than the present ⅛ inch application.

There is very little literature on

The percentage of Kentucky bluegrass in a combination cool and warm season mixtures as influenced by topdressing.

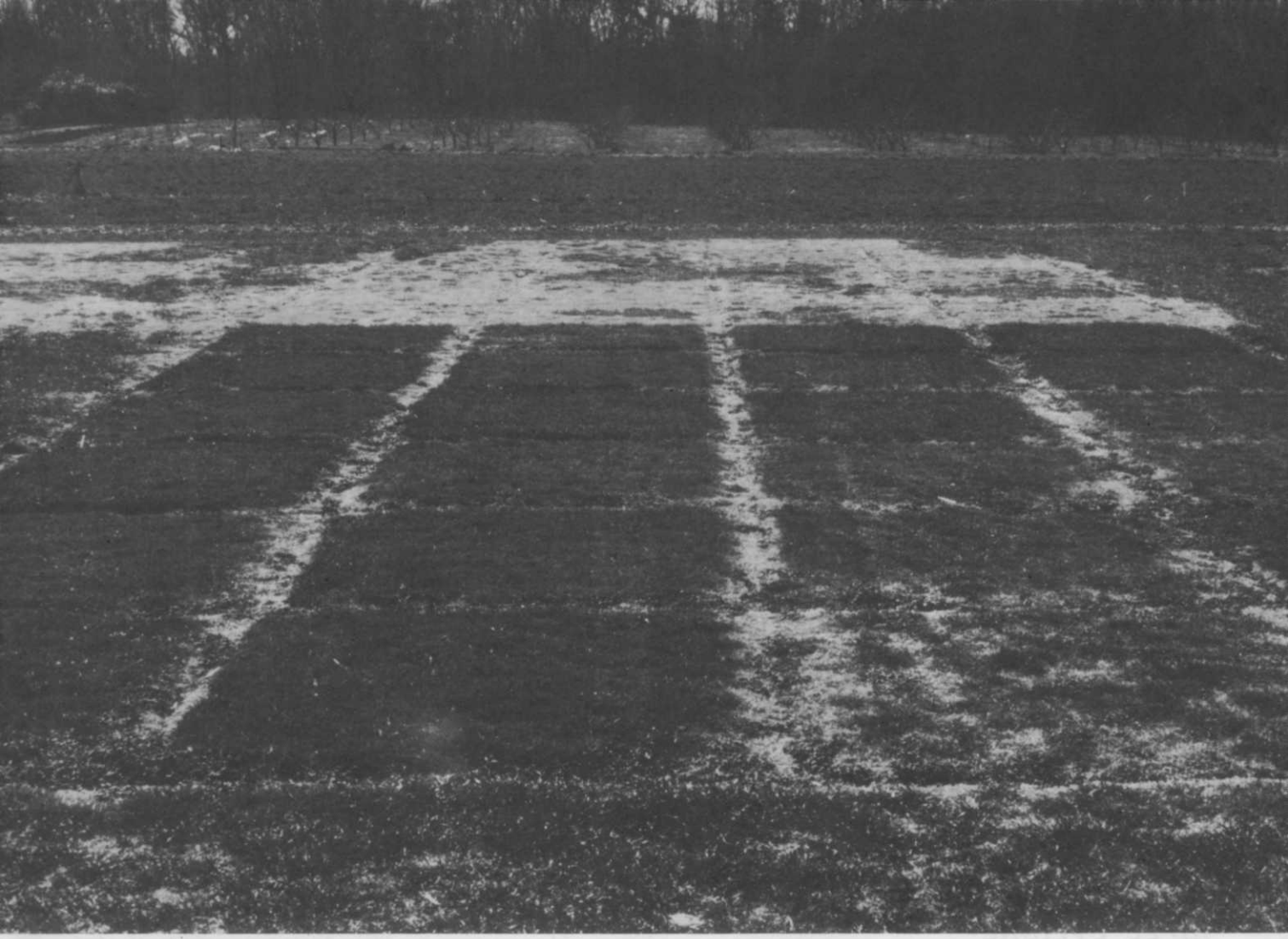
Date	Topdressing Treatments None	3 appli./yr.
April thru July '75	34 avg.	33 avg.
Sept. 75	11	10
Nov. 75	18	17
March 76*	46	36
May 76*	50	39
June 76	39	30
July 76	25	17
Sept. 76	13	10

*Means for these dates different at the 5% level of significance.

The percentage of creeping bentgrass in combination cool and warm season mixtures as influenced by topdressing.

Date	Topdressing Treatments None	3 appli./yr.
April thru July '75	48 avg.	48 avg.
Sept. 75*	10	21
Nov. 75*	9	37
March 76*	29	49
May 76*	35	52
June 76*	40	51
July 76	36	45
Sept. 76	3	7

*Means for these dates different at the 5% level of significance.



Improved turf quality for experimental plots on the left foreground are due to sand topdressing applied the previous year. Plots are a mixture of warm and cool season grasses.

the topdressing of turfgrasses. Engel (1967) reported on a ten-year study where topdressing was used in three out of ten treatments for thatch control.

He used a sandy loam topdressing containing 8 to 12 percent organic matter. Topdressing — containing treatments in this study were associated with reduced thatch, improved quality, reduced amounts of Poa annua, improved infiltration and freedom from dry spots.

Rice (1964) included topdressing in a relatively short term study he did on Penncross creeping bentgrass. He compared a sand, a loam and a loam-sand mixture with no topdressing. Skogley (1976) reporting on this thesis noted that the loam and the loam-sand mixtures produced the highest quality scores. Sand resulted in inferior quality scores in the spring but was better than no topdressing. In July of each year only the no topdressing treatment was rated inferior. Roots were more plentiful under topdressed turf, and in a fall sampling only sand topdressing had significantly more roots below two inches. Sand was found to be most effective in reducing the organic matter accumulation in the surface inch of soil.

Skogley (1975) also reported effects of topdressing on management of velvet bentgrass. Using a soil-sand mix he reports topdressing seven times per year resulted in reduced organic matter and improved turf quality score averages two out of four years when compared to two topdressings per year but not when compared to four topdressings.

Madison (1974), in several similar articles suggested topdressing with sand containing fertilizers and pesticides as "an alternative method of greens management". Thompson and Ward (1965 and 1966) report topdressing to be the management method which best reduces thatch under bermudagrass. Both Cole (1975), Madison and myself suggest that topdressing will reduce disease problems. Engel, however, found more dollarspot associated with topdressed bentgrass plots than untopdressed plots.

Most, but not all, writers on the subject favor topdressing. With those writers that do favor regular topdressing there is disagreement as to what should be used for topdressing material. Madison recommends sand and the USGA Greens Section appears to be leaning in this direction. Most of the old superintendents and most of the researchers above use or used a sandy loam, often with medium to high organic content. In the past, recommended practices were to use a material of

Continued on page 32

the same composition as your soil. But if you want to improve the soil, most of you would want a sandier mix which would hold promise of better drainage. So why not topdress with sand? I personally see no good reason for including organic matter in a topdress mix when reducing thatch accumulation (organic matter) is a principal goal. I would feel more comfortable in recommending straight sand topdressing if there were some research results showing that it was indeed better than a loamy sand.

A straight sand topdressing does offer advantages over a topdressing mix. It should be a lot cheaper, and secondly, one should be better able to spread it cheaply and easily with large cyclone spreaders. If you do go the straight sand route, I suggest you follow Madison's advice. Use sand less than 1mm in size. This gives you a material which will work easily into the surface mat and thus not interfere with mowers or golfers.

Straight sand topdressing is a lot cheaper and can be spread more easily and cheaply with large cyclone spreaders.

I agree with Madison in that the first couple of sand applications should go on after a heavy, deep aerification in which the cores are removed before topdressing. The sand should then be worked down into the holes so that there will be a transition zone of sand and old soil rather than a direct layer of sand on soil. If the soil below is extremely impervious you can still create a "Dagwood sandwich" of alternate layers of sand, thatch, calcined clay and other topdressing materials. Layers impede water, air and roots. Regardless of what you decide to do about topdressing, avoid layers of fine materials on coarse materials. Layers may cost you your turf and also your job.

Also I suggest that you topdress more frequently when creeping bentgrass stolons are growing the most. The peak growth period for stolon growth is the last half of June. Therefore, topdressing should be most frequent in the May through July period.

Holman Griffin recently wrote, "A good topdressing material (properly analyzed) can eventually modify or replace the poor soil to a depth which is adequate to give your green a new lease on life and provide a manageable situation." Properly done, topdressing can be beneficial to creeping bentgrass. Improperly done, it may cause you many more problems than it is worth.

I suggest you read the articles I mentioned by Engel, Madison, Skogley, Thompson and Ward before beginning on a topdressing program or before changing to a straight sand topdressing.

Dr. Douglas T. Hawes is assistant professor, department of agronomy, at the University of Maryland College of Agriculture at College Park.

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Reubens grass indicated for revegetation

Some of the toughest territories for revegetation in the cool season areas of the states and Canada are mining areas.

The Jacklin Seed Co. has researched a substantial number of grasses that have good revegetation characteristics. One of these, Reubens Canada bluegrass, was tested in metal mining and coal stripping areas. Results were significantly encouraging to both mining people as well as professionals who specialize in contracting for reseeding freeway cuts, county road projects, pipeline rights-of-way and other construction.

Reubens Canada bluegrass has an excellent tolerance factor that permits it to germinate faster and to establish a better density under low fertility conditions because of its aggressive rhizome growth and tiller development. It also persists in extremely dry, barren soils and regrows quickly after a fire.

Reubens is best suited for all cool season areas of Canada and the United States as well as portions of the warmer transition zones. Following establishment, Reubens survives severe extremes of cold and dry conditions.

Additional tests in progress indicate it could be included in most plans for revegetating subsoils exposed by telephone, power line and pipeline right-of-ways, ski slopes, sanitary landfills, backfilled quarries, stripmines, roadway cuts, mine tailing, earthen dams, dikes and burned areas.

Reubens appears to be a significant find in the continuing search for vegetation that can withstand poverty soils, lashing winds, and gully-washed rains, droughts and the challenge of erosion control. □

Better live oaks grown with new method

A novel method of propagating the live oak tree without using seeds has been developed by horticulturists at the Texas Agricultural Experiment Station (TAES).

The technique permits live oak growers to select trees for uniformity and provide superior trees for the public, according to Dr. David L. Morgan, horticulturist with the Experiment Station at Dallas.

Desirable characteristics in live oaks which could be selected and propagated include tree shape, leaf color, leaf retention in winter, increased growth rate, drought tolerance, and possibly insect and disease resistance.

The implications of landscape design with uniform plant materials are readily obvious to growers and landscape architects, Morgan points out. Instead of growing the oaks from seed, cuttings are multiplied from selected trees. This system, called asexual propagation, gives consistently high quality, uniform trees.

At present, nurserymen grow the live oak from seed. The problem with this method is that the live oak is wind pollinated, and seed from a beautiful spreading oak may also get half of its characteristics from a nearby tree that's weak, diseased, and ugly.

In the past three years, Morgan has successfully propagated native live oaks from tip-stem cuttings.

The cuttings are taken from young, select trees in the spring-summer growing season, treated with a chemical hormone, and kept in a high humidity chamber at the Experiment Station at Dallas.

Cuttings form roots in 12 weeks and when grown should be like the parent tree.

An example of the advantage of this method is the propagation of trees resistant to the mealy-oak gall. Morgan and two Experiment Station entomologists have discovered trees with apparent gall resistance. Such trees, if propagated through stem cuttings, would retain their resistance to galls. □

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Newly elected officers of the National Arborist Association are: Front row, from left, Kenneth B. Kirk, first vice president, Gerald E. Farrens, president, Larry Holkenborg, second vice president; Second row, from left, Bruce M. Walgren, secretary, Walter E. Money, treasurer, Boyd Haney, past president; Top row, from left, Erik H. Haupt, George P. Tyler, Earl J. Sinnamon, and Lee L. Lesh, directors.

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

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

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

Point #1: The Duffer Demands More.

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

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

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

Point #2: Machines Do More.

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

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

Which brings us to the third point.

Point #3: Longevity Makes Them Worth More.

Equipment life should be a prime consideration when you select a manufacturer. The longer a machine works, the more it does, and the less maintenance it requires, the better your investment. And here's where we'd like to put in a little plug for Cushman and Ryan turf equipment.

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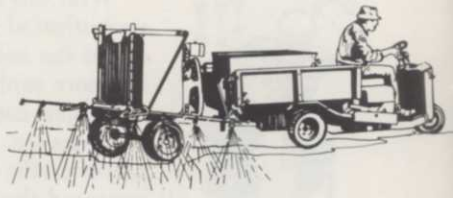

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• Reinder Bros. Turf Equipment
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• Loft-Kellog Seed, Inc.
Sun Prairie
• Turf Management Supply

Aerial photography useful for brush control

Ecological changes following brush control were studied on two honey mesquite infested deep hardland range sites in north central Texas by the Texas Agricultural Experiment Station.

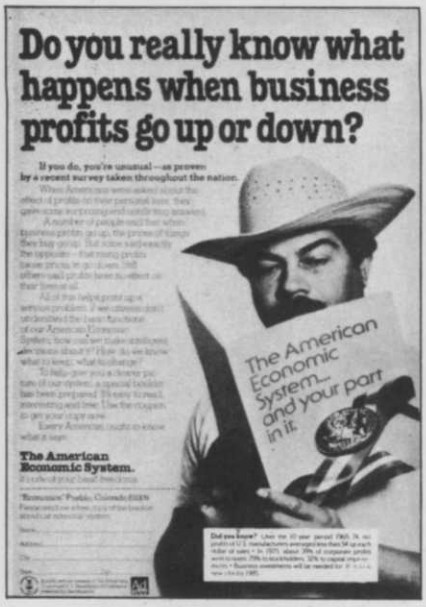
In the study, low altitude color infrared aerial photography was used to document the initial effects of brush control on secondary plant successions.

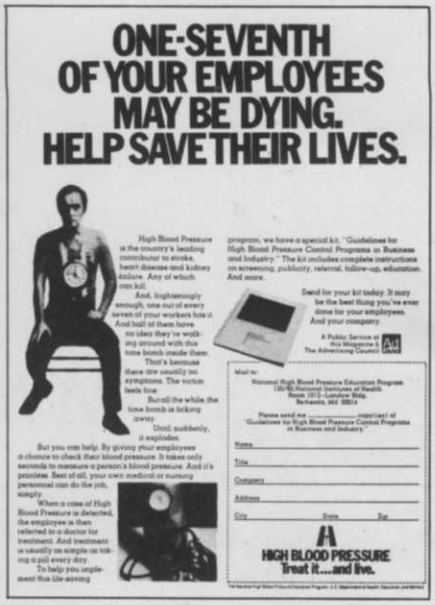
The first aerial photo mission was flown prior to treatment in the spring of 1973 and has continued to be taken each spring and fall through 1976.

Supportive field data were collected in conjunction with each photo mission.

Together, the field and aerial photo measures provided information on plant response to brush control which could not have been available using either technique alone. For more information, telephone K. C. McDaniel, J. H. Brock and R. H. Hass, College Station, Tex., 713-845-7012. □

WHY YOU SHOULD MAKE A CORPORATE CONTRIBUTION TO THE AD COUNCIL





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

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

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

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

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

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

Mail to: Robert P. Keim, President
The Advertising Council, Inc.
825 Third Avenue, New York, New York 10022

Ad Council

☐ Please send us your material

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

HIGHLIGHTS OF THE NEW TOXIC LAW

(What it means to you)

Under the legislation, EPA can require testing of new and existing chemicals that might present an unreasonable risk to health or the environment. A manufacturer is required to give 90 days notice prior to commercial production of the intention to manufacture a new chemical substance or a new use for an existing substance.

Here are some of the major provisions of the Legislation which are under EPA authorization:

1) Require manufacturer to test the substances so that their effect on health and the environment may be evaluated

2) Impose delays or restrictions on the manufacturer of a new chemical substance if there is adequate information to evaluate the effects

3) Adopt rules prohibiting the manufacture, processing, or distribution of a chemical substance or mixture, to require labeling telling possible hazards with use, or to regulate the manufacture manner of disposal of substances that are suspected to contribute to unreasonable risk

4) Require manufacturers and processors to submit reports and maintain records concerning the product's adverse health or environment effects along with providing available health and safety data

5) Manufacturer must immediately notify EPA if one of their substances contributes to unreasonable risk

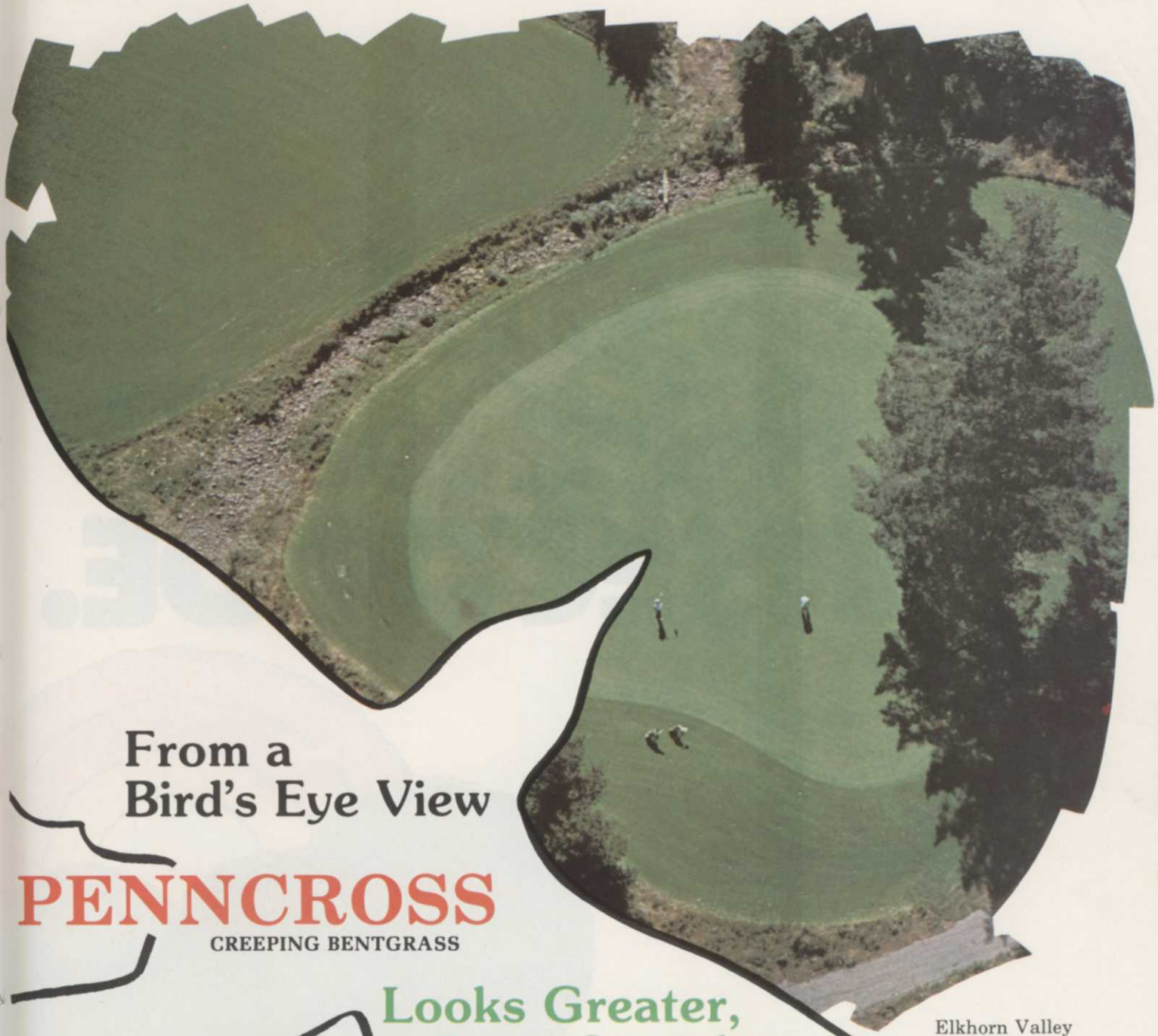
6) Enforce the bill through inspectors and court actions when a manufacturer is found in violation

7) Permit citizens to bring suits to obtain compliance with the bill

8) Federal district courts can order EPA to initiate rulemaking proceedings in response to citizens petitions

9) Provide ways for all interested persons to have an opportunity to participate in the EPA's rulemaking procedures

10 Provide for continuing evaluation of the effects on employment of actions taken under the bill



From a Bird's Eye View

PENNCROSS

CREEPING BENTGRASS

Looks Greater, Putts Straighter

Elkhorn Valley
Golf Course
Mehama, Oregon

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

FOR FREE TURFGUIDE, WRITE
PENNCROSS BENTGRASS ASSOCIATION
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SALEM, OR 97303

PENNCROSS BENT GRASS

WORLD-WIDE DISTRIBUTOR
TEE • 2 • GREEN CORP.
1212 WEST EIGHTH STREET
KANSAS CITY, MISSOURI 64101
(816) 842-7825

THE 44-INSECT INSECTICIDE.

For trees, ornamentals, and turf.
One solution versus 44 problems. Those are pretty good odds.

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

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

Its versatility also lets you cut down on the need for a large chemical inventory.

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

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

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

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

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

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

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

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

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

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

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

SEVIN® UNION CARBIDE
CARBARYL INSECTICIDE
STILL THE ANSWER.

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

Circle 134 on free information card

Pesticides may be frostbitten

The severe cold weather has posed another problem for pesticide users — the possibility of problems arising from frozen pesticide products.

The National Agricultural Chemicals Association (NACA) advises you to read labels. Liquid formulations and emulsifiable concentrates of pesticides carry a label caution against allowing such products to freeze. Since freezing may cause a separation of the various components making up the active and inert ingredients.

According to an NACA information bulletin, users may be able to see the separation in the oil-based material — sludgy precipitate, perhaps globules.

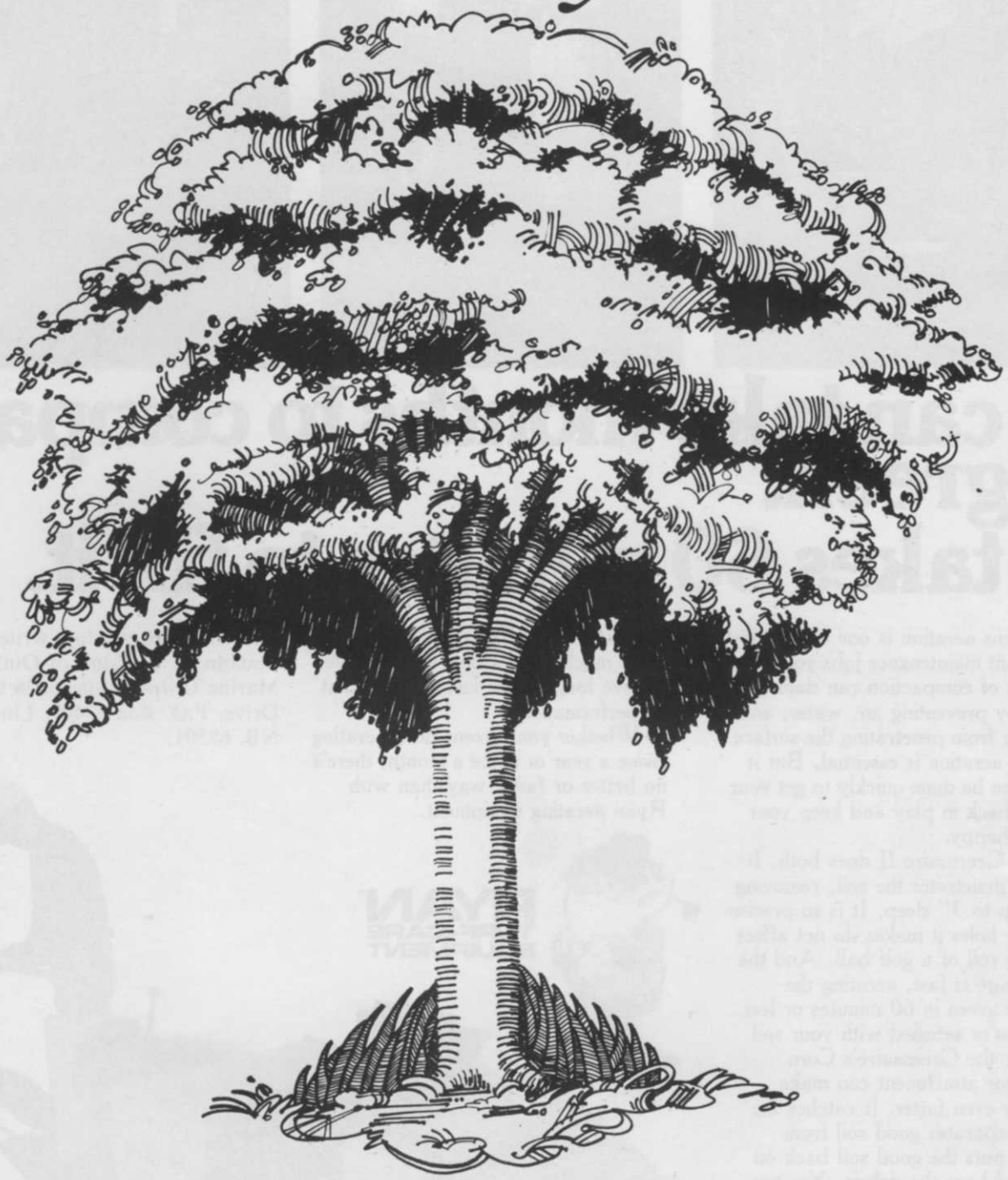
Liquid formulations may have precipitated crystals with some large enough to be visible. Often an audible sound is emitted from the container as it is rolled or rotated.

NACA says specific handling directions on the label must be observed. Some formulations can be reconstituted. Others are irreversible as a result of specific physical and chemical properties.

There are no short cuts, and according to NACA, none should be attempted. Crystals which have formed in liquid formulations may be only partially returned to solution in a short time at room temperature. The remaining crystals, microscopic in size, could still be present to erode the equipment and nozzles. Further, such crystals would be largely incapable of providing pesticidal protection since they are not in solution.

If, after following the label directions, a user has reason to believe that there may still be a problem with materials, he should call the company field representative for advice. □

The Stately Elm



Help protect the American Elm from Dutch Elm Disease with

CORREX™*

* Contains DuPont Lignasan BLP™ Fungicide.

A fungicidal aid injected into elms to help prevent infection of the American Elm by Dutch Elm Disease. CORREX arrests the spread of DED if infection is minimal at the time of injection.

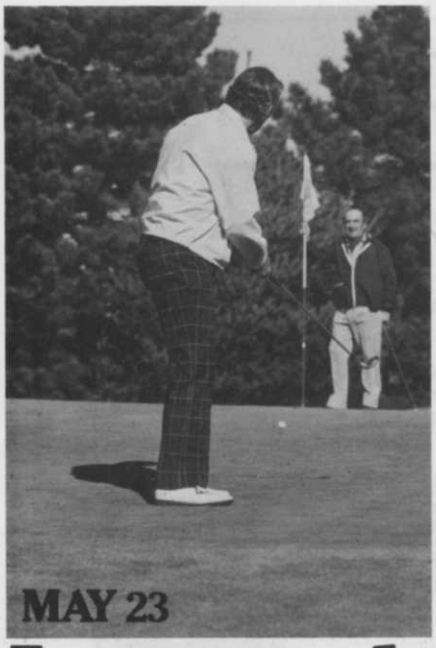
Tested and approved by Elm Research Institute, Harrisville, NH.

Call or write for details;

Hopkins
agricultural chemical co.

Box 7532, Madison, WI 53707
608/222-0624

Circle 105 on free information card



It can take months to compact a green. It takes 60 minutes to fix it.

Greens aeration is one of the most important maintenance jobs you have. Months of compaction can damage a green by preventing air, water, and fertilizer from penetrating the surface. Proper aeration is essential. But it must also be done quickly to get your course back in play and keep your golfers happy.

The Greensaire II does both. It cleanly penetrates the soil, removing cores up to 3" deep. It is so precise that the holes it makes do not affect the true roll of a golf ball. And the Greensaire is fast, aerating the average green in 60 minutes or less.

If you're satisfied with your soil content, the Greensaire's Core Processor attachment can make aerating even faster. It catches the cores, separates good soil from debris, puts the good soil back on top, and bags the debris. You top dress and collect thatch at the same time you aerate.

Maybe you don't need the big capacities of the Greensaire II and Core Processor, but you do want the same fine capabilities. Then choose the Greensaire 16. Instead of a 24" swath, you have a 16" width. You can use the same selection of tines and the convenient windrow attachment makes core removal easy.

And like all Ryan equipment, these machines are built to last. We believe longevity is just as important as performance.

Whether your greens need aerating twice a year or twice a month, there's no better or faster way than with Ryan aerating equipment.

For your free catalog, write OMC-Lincoln, A Division of Outboard Marine Corporation, 5526 Cushman Drive, P.O. Box 82409, Lincoln, NB. 68501.

Circle 129 on free information card

LAWN CARE INDUSTRY

This month we turn our Lawn Care column over to our readers:

WEEDS TREES & TURF, in its March issue, did an excellent job of detailing the history and rapid growth of the lawn care industry in the last 20 years.

However, thorough as your research was, I believe it failed to adequately focus on certain key factors without which no examination of this explosive industry can be complete.

I believe it is a matter of interest and importance to the many thousands of your readers who are independent landscape maintenance operators to have a complete picture in front of them, should any be contemplating which path to take in expanding their own lawn care operations.

The heavy emphasis on liquid application as practiced by several different companies, and the almost total absence of first hand comment from operators with long experience in applying granular materials, seed, aerating, etc., could make it seem that there is no worthwhile alternative, and I am sure this was not your intent.

Daniel Dorfman, president
Lawn-a-Mat Chemical & Equip. Corp.
Mineola, L.I., New York

(Ed Note: Granular application will be covered in our June issue.)

Your March issue "To Our Readers" and in-depth look at Lawn Care inspired me to add some thoughts.

1. I prefer the term more Professional to our industry, "Landscape Maintenance or Landscape Management". Our clients require planting, new lawns, tree care, turf management, fountains, etc. Fifty percent of our seasonal project is new contracting and 50 percent is maintenance.

2. We have too many organizations now, splitting our industry into: nursery, turf, arborists, contractors, etc. This divides and reduces our strength.

3. Upgrading the industry: As an example the WLCA. A committee spent two and one half years upgrading the industry and ended up lowering the standards to the poorest work. What we really need is total involvement, but this, like perfection, is only a goal.

Frank J. Foster, president
DAL Corp.
Muskego, Wis.

AAN backs FIFRA; urges some changes

In testimony before the House Committee on Agriculture, the American Association of Nurserymen gave its support to the basic concepts of the Federal Insecticide, Fungicide and Rodenticide Act, which covers uses of agricultural chemicals. The House is holding oversight hearings on extension of the Act which is due to expire this year.

While giving its support to limited extension, AAN also urged that changes be made which would allow use by nursery growers of pesticides that have been registered for more sensitive uses around the home or on food crops. This must be done, said the nursery group, if nursery growers are to have any chemicals available to them for pest control.

The testimony given by the AAN addressesd itself primarily to the unique problems with which the nursery industry is faced in the use of pesticides. "We say unique," explained Ray Brush, administrator for the trade organization, "because, unlike other agricultural commodities, we ship a live product, oftentimes with soil or growing media attached to the roots.

"Also the shipment of our product in intrastate commerce is subject to a plethora of federal and state quarantines and regulations.

"These programs are designed to restrict the movement of pests from geographic areas where they are known to be present in significant quantities to other areas where they are not present, and where substantial losses not only to nursery crops but also to other agricultural crops would result from their importation," continued Brush.

Since the enactment of the Federal Insecticide, Fungicide and Rodenticide Act, the nursery industry has encountered a number of problems, Manufacturers and formulators of pesticides are required to obtain an approved registration from the Environmental Protection Agency for each pesticide. Each application must be supported by a wealth of data concerning the pesticide — data which must be based on extensive research. □

For ad on following page circle 107 on free information card ▸

Aquathol® K cleans up your water weed problems.

Recreational lakes are meant to be fun places. Swimming. Boating. Fishing. Not choked with unwanted water weeds.

Aquathol K aquatic herbicide cleans up these problems—fast, effectively and efficiently.

In fact, you can swim in lakes treated with Aquathol K 24 hours after application. And treated water can be used immediately for golf course irrigation without harm to turf.

Whether you're a professional applicator, recreational lake supervisor, or private land owner, get Aquathol K liquid or Aquathol granular. And clean up your water weed problems.

For more information, contact AGCHEM DIVISION, PENNWALT CORPORATION, 1630 E. SHAW AVE., FRESNO, CALIFORNIA 93710 (209) 226-8400.

All pesticides can be harmful. Read the label carefully and use only as directed.

AQUATHOL® K
Aquatic Herbicide.

PENNWALT
CHEMICALS ■ EQUIPMENT
HEALTH PRODUCTS

Freeze, drought raise casualty questions

Nursery firms will be facing questions this year as to the availability of Federal income tax casualty loss deductions, due to the recent cold winter conditions in the North and East and continuing drought in the West. The American Association of Nurserymen's legal counsel offers this advice:

The IRS take the position that damage caused by drought cannot be deductible casualty loss, since it does not occur suddenly. Nevertheless, some courts have allowed such deductions, and taxpayers may wish to seek legal or accounting advice on their allowability in appropriate cases.

The IRS does not recognize that plant damage caused by freezing conditions can be a deductible casualty loss, where the freeze is unusual. This depends on normal condition in the particular area.

The amount of allowable deduction differs depending on whether the damaged property is inventory property or is customer property. In the case of customer property, it differs further depending on whether the property is used in a business or represents landscaping of a home or other non-business property.

Inventory losses not covered by insurance do not generate a casualty loss deduction because they will automatically result in a greater deduction for cost of good sold.

When covered by insurance, inventory losses may either be reflected in cost of goods sold based on closing inventory, with inclusion of the insurance recovery as gross income; or alternately, the taxpayer may ignore the insurance recovery and remove the loss from the cost of goods sold.

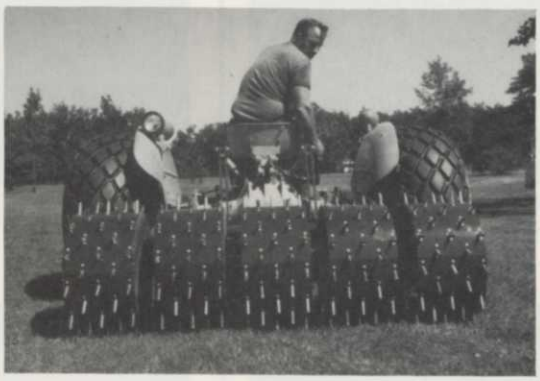
In the case of landscaping on a customer's business premises, the taxpayer may claim a loss based on the "before" and "after" value of the damaged plants, but the loss may not exceed the adjusted basis (depreciated cost.)

Where the plants represent landscaping on non-business property, the legal question is the amount of loss reflected in the "before" and "after" value of the entire premises. □

Our Fairway Aerator Can Pick Up The Cores!

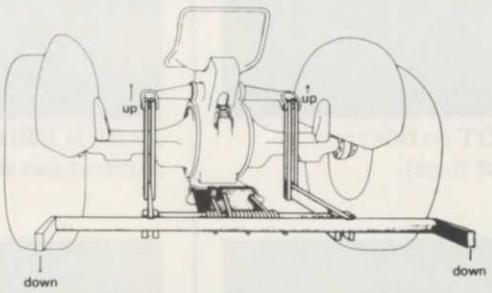
MOUNTS TO ANY TRACTOR

TCA-601 Supreme with conversion unit — 180 tines (300 if necessary). Has hinged door and removable sides. *Collects plugs internally or can be used same as standard model.*



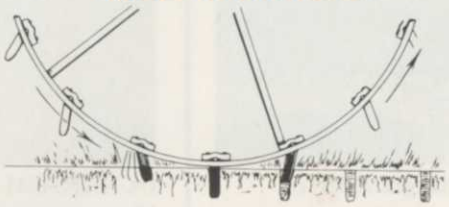
TCA-601 Supreme with conversion unit and 180 tines (300 if required). Can be operated forward or backward to aerate a 6 foot swath.

CONVERSION FRAME AND ARM ASSEMBLY



Using tractor's hydraulic system, hydraulic arms are raised applying down pressure on the aerator.

HINGE PLUG PRINCIPLE



The unique hinged tine enters straight and pulls a clean plug straight out of the turf. A ¾" tine gives you a 3" deep plug. A ½" tine is also available.

Dedoes

the Aerating Pro

ONE MAN can aerate all 18 holes on a golf course in 8 hours or less!

Gives you a neat clean aerating job with hole pattern and depth to suit your individual needs.

Is rugged and requires little maintenance.

Also available — the DEDOES TEES and GREENS AERATOR — offers the same advantages as our Fairway unit.

We have a distributor in your area.

Manufactured by

Dedoes Industries, Inc.

1060 West Maple Road, Walled Lake, Michigan 48088
(313) 624-7710

Circle 122 on free information card

For ad on preceding page circle 106 on free information card

Why TERSAN® fungicides give you Total

LEAF SPOT (Helminthosporium spp.) on bluegrass.

DOLLAR SPOT* (Sclerotinia homoeocarpa) on bentgrass.

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

LEAF SPOT on bentgrass (melting-out stage).

LARGE BROWN PATCH (Rhizoctonia solani).

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

RUST (Puccinia graminis) on bluegrass.

FUSARIUM BLIGHT (Fusarium roseum and Fusarium tricinctum).

PYTHIUM BLIGHT or Cottony Blight (Pythium spp.).

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

TERSAN 1991 and TERSAN 75 effectively control Dollar Spot and Large Brown Patch. TERSAN 1991 controls Fusarium Blight.

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

TERSAN SP provides outstanding control of both Typhula Blight and Pythium Blight.

Turf Protection.

You're faced with a lot more than one or two turf disease problems. That's why you need the Du Pont TERSAN program. It gives you protection against just about every disease your course will ever encounter.

But you get more than proven, effective control with the TERSAN program. You get economical control as well. You use just the treatment that works on a given problem. There's no waste. No extra expense. You pay only for the specific treatment to control a specific disease.

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Meeting Dates

Texas A&M University Turfgrass Research Field Day, TAMU Turfgrass Field Lane, Agronomy Rd., TAMU campus, College Station, Tex., June 1.

EPA Second National Conference on the Interagency Energy/Environment R&D Program, Sheraton-Park Hotel, 2600 Woodley Rd., N.W., Washington, D.C., June 6-7.

15th Annual Turfgrass Sprinkler Irrigation Conference, Univ. of Calif. Arrowhead Conference Center, Riverside, Calif. June 10, 12.

National Turf Management Clinic and Tradeshow, O'Hare Inn, west of Chicago, July 25-26.

Seventh Annual Trade Fair and Fertilizer Conference, Convention Center, Kansas City, Mo., July 26-27.

1977 Pennsylvania Allied Nursery Trade Show, Hershey Motor Lodge, Hershey, Pa., July 26-27.

Rutgers Turfgrass Research Field Day, Ryders Lane, New Brunswick, N.J., Aug. 4.

1977 AAN Management Seminar, Callaway Gardens, Pine Mountains, Ga., Aug. 21-26.

Green Industry Seminar & Trade Show, Springfield-Oaks Park and Youth Activities Center, Davisburg, Mich., Oct. 25-26.

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UPDATE: OSU Pythium blight research

For the past three years research has been under way on Pythium blight in the department of plant pathology at Ohio State, primarily through graduate student research. Dr. John L. Saladini completed his doctoral studies under the direction of Drs. P. O. Larsen and A. F. Schmitthenner on various aspects of this disease.

He surveyed approximately 50 Ohio golf courses for the presence of Pythium spp. in 1974 and 1975. At least 16 different species of Pythium were isolated, only three of which proved capable of causing disease. This observation suggests the need for proper identification of isolated Pythium fungi, since many of them are simply soil residents and usually do not cause disease.

Pythium aphanidermatum is the primary species associated with Pythium blight on courses sampled. Pythium ultimum, previously thought to be an important causal organism was never isolated. Pythium graminicola was occasionally isolated and suggested the possibility of a root rot type of Pythium disease typical of symptoms caused by this organism on other nonturfgrass plants. Laboratory and greenhouse investigations supported this hypothesis. When roots of Pennlawn red fescue were inoculated with P. graminicola, severe root rot and subsequent foliar death occurred.

Tom Hall, another graduate student working with Larsen and Schmitthenner, will soon complete a study in which he is critically following the development of Pythium blight on golf course sites having an extensive history of Pythium blight.

He has been sampling roots, shoots, thatch and soil from these sites and is correlating presence of Pythium with temperature and relative humidity to learn more about the effects of environment on the disease outbreaks to enable turfgrass managers to forecast the incidence of Pythium blight. This type of disease forecast may enable a golf course superintendent to apply fungicides early enough to avoid any damage from this explosive disease or to avoid unnecessary and expensive applications of fungicides when they are not needed.

Fungicidal control studies in field and laboratory are also under way concerning Pythium blight. Dr. Larsen is in charge of this program.

Prepared by P.O. Larsen, associate professor, OSU department of plant pathology and Ohio Agricultural Research and Development Center.

Products

GUARD-TEX, an easy-to-use, self-adhering tape is now available to the nursery trade and home gardeners. Made by General Bandages, Inc., GUARD-TEX allows trees to breathe, sticks only to itself and can be easily removed without leaving a gummy residue.

GUARD-TEX provides protection for newly planted trees and bushes from rabbits, mice, dogs, etc., and from sun scald and windburn. It also helps prevent bark splitting and is useful in grafting operations. It weathers well becoming as stiff as buckram, yet strips off easily.

Circle 701 on free information card

White-Hercules engines are now offered in addition to Ford industrial power units with the trailer model of the "Whisper Chipper," the original wood chipper made by the Asplundh Manufacturing Division of Asplundh Tree Expert Co.

The 12-inch Chipper model is now available with a 4-cylinder White-Hercules Model G-1600 engine manufactured by the Hercules Engine Division of White Engines, Inc., Canton, O. The new power unit was extensively tested by Asplundh before it was added as an option to the Chipper line.

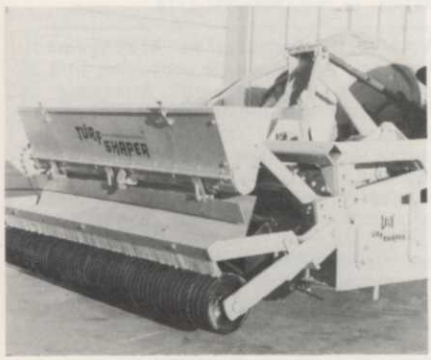
Circle 702 on free information card

A new, high-production machine, designed for direct burial of underground distribution systems, has recently been introduced by Vermeer Manufacturing Co.

The Vermeer M-485, a heavy-duty, multi-purpose unit, is available with a choice of two liquid-cooled power plants: the 192 C.I.D. Ford gasoline engine or the 254 C.I.D. Ford diesel engine. Engine output is coupled to a Sundstrand hydrostatic drive, which in turn, powers a Funk 4-speed transmission. With this type of drive system, the operator may select the ground speed that's best suited for maximum production in his particular soil conditions.

With the Vermeer P-20 Vibratory Plow attachment (featuring trailer-type design), the M-485 can install cable up to 2" in diameter, down to a depth of 30". The Vermeer Trencher attachment, with various chain and boom options, digs a trench up to 16" wide, down to 6'.

Circle 703 on free information card



Lely is introducing the "Turfshaper" for commercial landscaping, highway construction and beautification, park and other recreational area landscaping. In an eight-hour day, one man can completely seed or reseed an area of ten acres. There is no loss of time changing from disks to scrapers, scrapers to rakes, rakes to seeders, seeders to rollers, etc.

The "Turfshaper" is currently available in a sixty-inch width and can be operated with a 25 to 45 PTO hp tractor equipped with Category I or II three-point hitch.

Circle 704 on free information card

A heavy-duty model power mower, featuring an "extra-size" 1½ gallon fuel tank, highlights Lawn-Boy's 1977 commercial power mower line.

The 21-inch mower also has fingertip wheel adjustment, steel ball bearing wheels and a two-position handle. An under-the-deck muffler is designed to direct noise and exhaust to the ground.

Circle 705 on free information card

Landglas erosion control system from Owens-Corning Fiberglas Corporation is spray-applied in random pattern with air-powered applicator gun, forming a resilient, porous fiber glass mat that protects newly seeded and filled areas. The mat is held in place with a tack coating, such as asphalt, which is applied later in the operation.

Circle 706 on free information card

ICI United States Inc. introduces GRO-SAFE Activated Charcoal, a soil protection agent available to improve seeding, over-seeding, reseeding, and sodding, and to clean up hydraulic or herbicide spills. GRO-SAFE has been used successfully with the most commonly-used turf herbicides such as 2, 4-D, 2, 4, 5-T, ATRAZINE, AZAK, BALAN, BANDANE, BETASAN, DACTHAL, KERB, MCPP, SILVEX, SIMAZINE and TANDEX. This does not include highly water-soluable herbicides. GRO-SAFE can be applied with conventional equipment either in dry powder or slurry form.

Circle 707 on free information card

Classifieds

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

Rates: All classifications 65¢ per word. Box number, $1. All classified ads must be received by Publisher the 5th of the month preceding publication date and be accompanied by cash or money order covering full payment. Mail ad copy to: Dorothy Lowe, Weeds, Trees & Turf, P.O. Box 6951, Cleveland, Ohio 44101.

USED EQUIPMENT

2 — 50' AERIAL BASKETS — 65 Aerial basket, 2 Asplundh brush chippers. 1 Vermeer tree mover, 1 Vermeer stump cutter. Small hydraulic crane, 2 John Bean sprayers, ten ton tri-axle trailer, 1 Prentice log loader, tractor with front end loader and Bobcat loader, Parkway Tree Service, 120626 W. Cherry, Wauwatosa, Wis. 414 257-1555.

FOR SALE CHIPPERS, ready to work. 1972 Mitts & Merrill V-8 16", $3,495.00; 1971 Fitchburg 330, V-8, 12" less than 1000 hours, $3,295.00; Mitts & Merrill 4 cylinder, 12", new engine, 1976, $2,495.00; Asplundh 4 cylinder, 12" excellent, $3,295.00. Two (2) Meyers sprayers, 10 gallon per minute — 200 gallon tank. 1-1966, $400.00. 1-1970, $900.00. We buy-sell-trade all kinds of used tree equipment. Edwards Tree Equipment and Leasing Co., 3190 Cooper Foster Park Rd., Vermilion, Ohio. Phone 216 967-6750.

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

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

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

FOR SALE: 50' Aerial Bucket, 1977 F-750 equipped with 50' reachall aerial bucket, 4 each outriggers with self-dumping 10' chip bin and 100 hp x 12" wide chipper mounted on rear. This is a self-contained, 2-man tree trimming unit. For photo and info call 303 789-9401.

1971 HIRANGER — mounted on International, 52 ft. working height. 1973 Scott Midland crane, 4 x 4 International, 35 ft. and extension. Two Asplundh brush chippers 16" blade. Sheets Tree Expert Co., Beulah Lane, Pittsburgh, Pa. 15235. Phone: 412 241-1019.

1969 INTERNATIONAL 1300 trimming truck, equipped with 12 yd. chip body, 10 ton hoist and built-in tool compartments. Funk Bros. Tree Service, Inc., R2-506 U.S. 250 East, Ashland, Ohio 44805. Phone 419 325-2113 or 289-2422.

CUSTOM BUILT SPRAYERS, piston, gear and centrifugal pumps, stainless steel and fiberglass tanks. If you have need for a special sprayer call for information. Westheffer Company, Inc., P.O. Box 363, Lawrence, Kansas 66044. Phone 913 843-1633.

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USED SKYWORKERS and Servi-Lifts aerial buckets, 35 to 52 feet. Call P. C. Gould Sales Co., Middlesex Turnpike, Essex, Conn. 203 767-1636.

1960 SKYWORKER mounted on F-600 Ford truck with chipping box, also with large tool box, good condition, $6,500.00. Phone 513 767-1167; 513 878-2332.

WANTED: Sod load handler by Foxcroft Development. Tischler Zoysia Grass Farm, 4206 Medical Parkway, Austin, Texas 78756.

1970 FORD F600 50 ft. Sky worker, $9000.00. Cannady Tree Service, South Bend, Indiana. Phone 219 291-5115.

FOR SALE: Bean Rotomist $9,000.00 303 284-6377.

SEEDS

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HELP WANTED

SALES HELP WANTED — A.A.A. Tree Service looking for men with sales experience. Year around work, age no factor, also tree climber with or without own equipment. Henry Hardy, P.O. Box 6173, Orlando, Fla. 32803. Phone 305 339-5242.

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TIRED OF FREEZING WINTER? Move to sunny New Orleans. Work and play in year round comfort; enjoy fabulous fishing, hunting, camping or night life! Positions open with a future. Starting salary $10,000 yr. guaranteed plus commission. Earning unlimited. Wanted 2 top notch tree surgeon climbers min. 5 yrs. experience. Must be sober and dependable, drive big bucket rigs. Wanted 2 graduate horticulturists or agronomist to spray, consult and sell out protective ornamental and turf spray. Programs on established protected spray routes. $10,000 year salary plus commission, our horticulturists average $20,000 year. Prefer family men; turf, weed control or ornamental spraying or nursery background necessary. Send resume and phone to: Environmental Services, Inc., Graduate Horticulturists, 3781 Dixon St., Metairie, La. 700001, or call (504) 837-2314.

WANTED: Vegetation Management Specialist. A nationwide consulting firm is seeking an individual with experience in developing vegetation management programs for electric utility rights-of-way, qualifications should include as a minimum, A.B.S. degree in forestry or other related fields plus two years practical experience in right-of-way management. Applicant must demonstrate a background in all aspects of distribution line tree trimming and transmission right-of-way maintenance methods, procedures and record systems. Salary commensurate with background and experience. Please send resume, in confidence, to: Personnel Dept., P.O. Box 13508, Philadelphia, Pa. 19101.

AGGRESSIVE AND FAST-GROWING Western New York tree-care company is looking for an intelligent and aggressive salesman with management ability. Applicants must have had a minimum of 1 year college education in forestry or related curriculum, plus one year experience in sales or field work. Salary, benefits and working conditions are tops. Send complete resume and personal data to Ken Knox, President, Lewis Tree Service, Inc., 225 Ballantyne Road, Rochester, New York 14623.

TERRITORY MANAGER — Sales and Service — Commercial mower manufacturer has several openings in the central U.S. and western mountain states. Position requires a self starter who can demonstrate our equipment to the user and complete the sales through approved dealers. Salary plus company benefits, car and travel, expenses. Send complete resume to Box 167, Weeds, Trees — Turf, Box 6951, Cleveland, Ohio 44101.

YEAR ROUND WORK — Funk Bros. Tree Service, Inc. of Ohio. Looking for experienced foremen and climbers for line clearance and private work. Must have experience with trucks, chippers, saws, etc. Send resume to: Funk Bros. Tree Service, Inc., R2-506 U.S. 250 East, Ashland, Ohio 44805. Phone 419 325-2113 or 289-2422.

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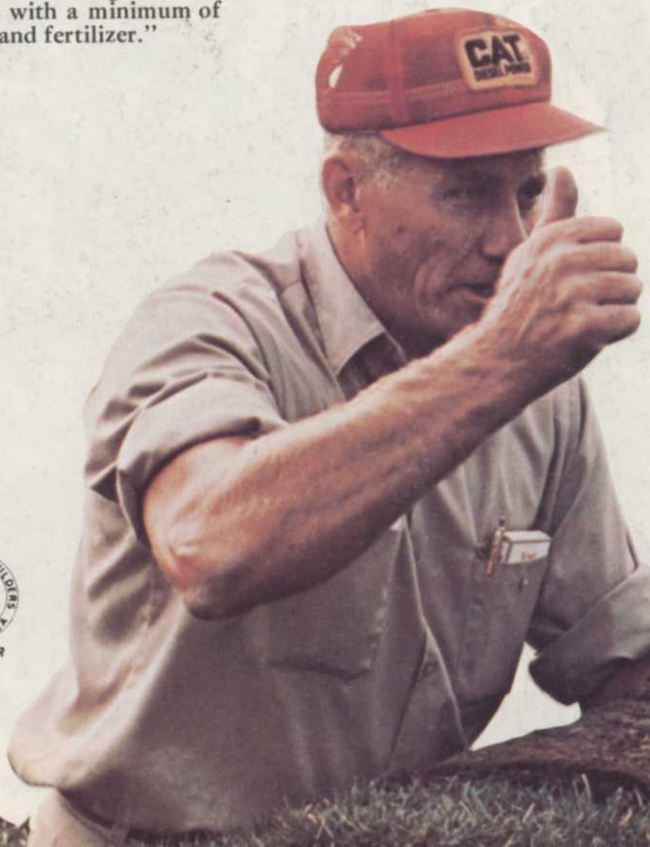

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