



From left: Frank Dobie, MITF director and general manager of Sharon Golf Club, Sharon Center, OH; Bill Burdick, MITF director and superintendent of Canterbury Golf Club, Cleveland, OH; Dr. Fred Gray, MITF president; Bill Lyons, MITF director and owner of Lyons Den Golf Club, Canal Fulton, OH; and Frank Floyd, president of Canterbury Golf Club.

Musser Invitational Benefits Research

The second Stroke Play Invitational Tournament, for the benefit of the H. B. Musser International Turfgrass Foundation, was held recently at Canterbury Golf Club in Cleveland, Ohio. This event was again arranged and conducted by the Cleveland District Golf Association. Mr. Henry J. Meiers, Executive Secretary of the Cleveland District Golf Association, said that the response was very gratifying and he predicted that the event would continue to grow with each consecutive year.

Proceeds of this event go to the H. B. Musser International Turfgrass Foundation to fund fellowships for individuals in the turfgrass research field who will be getting masters and doctorate degrees in turfgrass sciences, international in scope.

A field of 116 golfers participated. Prizes were awarded for low gross and low net. The \$35.00 entry fee, covered practice balls, golf carts, golf and an excellent buffet lunch. The event will be held again next year at a site yet to be determined.

Tree Borer Control Perfected

Dr. John Severson, a plant physiologist in the Dept. of Biology at St. Louis University has evidence which indicates that borers can successfully be controlled in municipal street trees with a minimum cost and effort.

His research to perfect an improved technique of controlling insects was prompted by recent regulations of the EPA regarding uses of certain insecticides in municipal tree spraying programs

which has made blower-mist sprayers almost obsolete.

In a cooperative research venture with the St. Louis Community Development Agency, Severson treated a boulevard planting of Modesto Ash infested with the Lilac Tree Borer. The insects hatch in May and June and the larvae feast on sap in the cambium layer throughout the summer. The tree is soon completely pruned of top

(continued)

Game Time to Give Award

Game Time will again award four scholarships for the Spring Term of 1976, providing tuition support for research projects in the fields of recreation and leisure services. More than 200 colleges and universities that offer undergraduate or graduate degrees in those fields have been invited to participate.

Life Science Products Co. Stops Kepone Manufacture

EPA has ordered Life Science Products Company of Hopewell, Virginia to stop the sale, use or removal of the compound Kepone.

Life Science is the nation's sole manufacturer of the chemical and is under exclusive contract to the Allied Chemical Corporation. Kepone is used to fight fire ants and roaches.

Life Science's plant closed voluntarily July 24 after seven out of 10 employees became ill. The Virginia State Health Department later allowed it to reopen, but only to package the company's remaining inventory.

Alvin R. Morris, Deputy Regional Administrator, said the order was issued in accordance with the Federal Insecticide, Fungicide and Rodenticide Act. An investigation is also being conducted to determine the health-related effects of Kepone as well as the extent to which it may be found in the water and on the land near the plant.

The order permits shipment of the remaining inventory to the Allied Chemical Corporation in Baltimore, Maryland in order to have the material located at a site where it can be safely handled and stored.

Further manufacture of the product is also prohibited since Life Science is not a registered pesticide-producer establishment.

The order requires Life Science to notify EPA in advance of any shipment, specifying the dates, amounts and modes of transportation.

Failure to comply with the order could subject Life Science to criminal penalties of up to \$25,000.

growth by the insect girdling the limbs.

How to control an insect inside a tree that is planted in a tree well surrounded by concrete sidewalks was the thesis of the research. A systemic insecticide was dissolved in a nutrient solution containing iron chelate and a plant growth stimulant which is subsequently injected into the root zone. A specially designed patented drill/injector was used to go rapidly through the concrete and adjacent soil without interference of roots and rocks. The drill/injector is attached to a self-contained unit with regulating control tanks. Various concentrations of systemic insecticides were used with some being dissolved only in water. Water soluble dyes were used as indicators in some of the treatments.

Results showed rapid translocation of the systemic insecticides into the woody tissue and leaves. Dead insect larvae were found in their tunnels containing the dye. Of course interest was the recuperative power of the Modesto Ash once the insect population was reduced or eliminated. New shoot growth and healing of open scars were observed when the treatment solution was applied.

Severson has shown that with proper tool and scientific control methods, municipalities can control insects in street trees without spraying.

Northeastern Scientists Study Gypsy Moth Control

Scientists in Maryland and Delaware will study biological ways to suppress gypsy moths under two cooperative agreements with the U.S. Department of Agriculture (USDA).

The gypsy moth, *Porthetria dispar*, is a forest pest which causes severe forest and environmental damage. Maryland is on the border of an expanding gypsy moth population.

USDA's Agricultural Research Service (ARS) will provide \$169,000 for the two-year studies.

At the Maryland Department of Agriculture, Annapolis, Dr. R. M. Altman, entomologist, will lead a team of scientists studying ways to suppress gypsy moth outbreaks. Disparlure, a synthetic sex attrac-

tant for male gypsy moths, will be field tested in infested areas of Maryland. This testing, over about 35,000 acres, will determine disparlure's effectiveness in confusing and inhibiting mating in isolated infestations. Dr. Ralph E. Webb, entomologist, Beltsville, Md., is the ARS representative for this \$160,000 agreement.

In Delaware, the Agricultural Experiment Station of the University of Delaware, Newark, will study moths on the Delmarva peninsula that may be alternate hosts for gypsy moth parasites. Imported parasites and predators of gypsy moths have been unsuccessful in keeping gypsy moth populations low. Alternate hosts could play a major role in maintaining sufficient populations of these natural enemies of the gypsy moths. Dr. D. F. Bray, professor of entomology and applied ecology at the university, is the project leader.



The 1975 expanded revision of the authoritative **HANDBOOK** first published 1955 — last revised 1966. Backed by assistance from outstanding U.S. turf authorities. Full color illustrations of turf diseases, weeds, weedgrasses and methods of control, proper spray methods, systemic turf fungicide discussion, use of turf colorants, etc. Focus on principles of sound turfgrass management, turf disease and weedgrass identification, and other features. Available through Mallinckrodt's nation-wide network of Turf Products Distributors for \$1.95.

Dow to Open 2,4-D Plant Bolster Supply for 1976

Dow Chemical U.S.A. announced that a new plant for the production of 2,4-D herbicide will be started up in the second quarter of 1976, eliminating the gap that has existed between supply and demand for the past two to three years.

Fred H. Sullivan, Dow marketing manager for herbicides, said critical shortages had been caused by worldwide growth in demand and shortages of raw materials. The new Dow plant will manufacture not only the 2,4-D but also the basic building blocks for this material. Under construction in Midland, Mich., since 1973, the new plant will increase Dow's domestic capacity for 2,4-D production by 70 percent.

The most widely used of the phenoxy herbicides, 2,4-D is in high demand in agriculture because it increases crop yields through the control of broadleaf weeds in lands planted to wheat, corn, oats, barley, sorghum, rice and sugar cane. It also is used to increase grass growth through brush and weed control on pastures and rangelands.

"Although 2,4-D has been used for 30 years, weeds have not developed resistance to the material," Sullivan said. "But there are changes in types of weed infestations. For tougher weeds, the farmer now uses 2,4-D in combination with newer herbicides, such as picloram, and the economics stay well within an efficient range."

Earlier this year, a report by the Council for Agriculture Science and Technology forecast "expanded usefulness for 2,4-D and related chemicals in the management of such diverse resources as croplands, forests, ranges, waterways, industrial lands, public utility properties, wildlife habitats, urban parks, athletic fields and landscape plantings."

"The phenoxy herbicides are widely used," the report said, "because they are more efficient and usually less hazardous and less injurious to the environment than alternative methods."

Environmentally, 2,4-D rates well because of its rapid breakdown into common elements such as carbon dioxide and water. This new facility will have a minimum of by-products.

"Our experience with your lawn seed, Game, was so unusual I felt that you would be interested in hearing about it.

An abandoned hospital site which had stood idle for 15 years was seeded on July 3. Our only preparation was to grade, install a sprinkling system, and water.

It was difficult to believe that less than 4 weeks later, on July 28, we cut the grass for the first time.

I cannot speak too highly of your remarkable grass seed, Game."

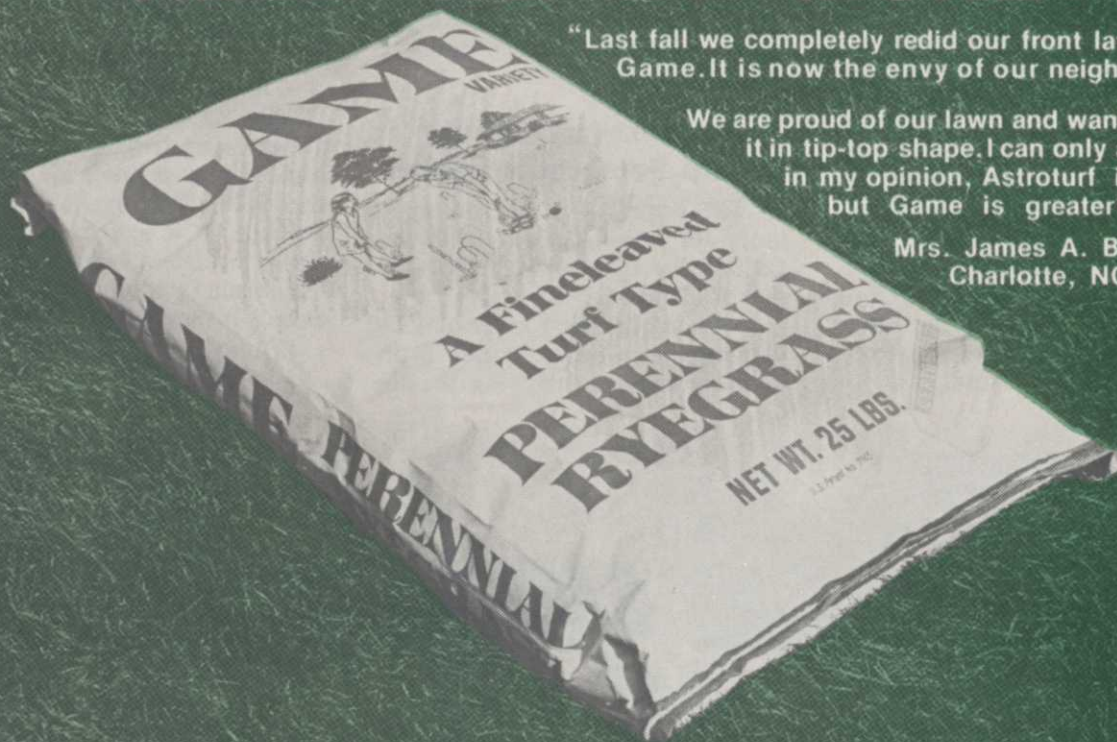
Lt. Col. John LaFranchise
Gowen Field, Idaho

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Fire Ant Control Extended Soil Movement Restricted

Fire ant quarantine restrictions on the movement of certain agricultural items are being extended to cover additional parts of Alabama, Arkansas, Florida, Georgia, Mississippi, North Carolina and Texas, the U.S. Department of Agriculture (USDA) announced today.

James O. Lee, deputy administrator of USDA's Animal and Plant Health Inspection Service (APHIS), said the action was taken because the imported fire ant has spread into areas that formerly were free of the pest.

"These states are already under the federal import fire ant quarantine," Mr. Lee explained, "But we restrict movement of items such as soil and earth-moving equipment out of those areas that are actually infested."

The latest action put movement restrictions — for the first time — on articles in all or parts of these counties: Marshall, Ala.; Drew, Ark.; Broward, Dade, Martin, Monroe, Palm Beach and St. Lucie, Fla.; Chandler, Douglas, Hancock, Jefferson and Polk, Ga.; Leflore, Sunflower and Tippah, Miss.; New Hanover, N.C.; and Anderson, Bandera, Caldwell, Calhoun, Frio, Gonzales, Grayson, Guadalupe, Kerr, Leon, Limestone, Navarro, Robertson, Upshur and Wood, Tex.

Also, movement restrictions are being extended to more parts of these previously infested counties: Lawrence and Winston, Ala.; Ashley, Ark.; Carroll, Haralson and Morgan, Ga.; Bolivar, Grenada, Humphreys, Lafayette and Prentiss, Miss.; Columbus and Pamlico, N.C.; Darlington, S.C.; and Collin, Comal, Fayette, Matagordo, Rusk and Tarrant, Tex.

"The fire ant's sting is extremely painful," Mr. Lee commented, "and can cause severe reactions in allergic persons." Besides damaging some crops, fire ants deface landscapes with large mounds and interfere with farming, gardening and use of parks, school grounds and other recreational areas.

The revised quarantine takes effect Aug. 6. A notice to that effect will be published in the Aug. 6 Federal Register. To obtain copies, at no charge, write Plant Protection and Quarantine Programs, APHIS, USDA, Federal Center Building, Hyattsville, Md. 20782.

First Centralized Library Set Up For Drip Irrigation

The world's first centralized library for information on drip irrigation is being set up at the University of California, Riverside.

Funding for the Center on Drip Irrigation — a relatively new drop-watering process involving the fre-

quent slow application of water to soil — was authorized at the July, 1974 International Drip Irrigation Congress in San Diego.

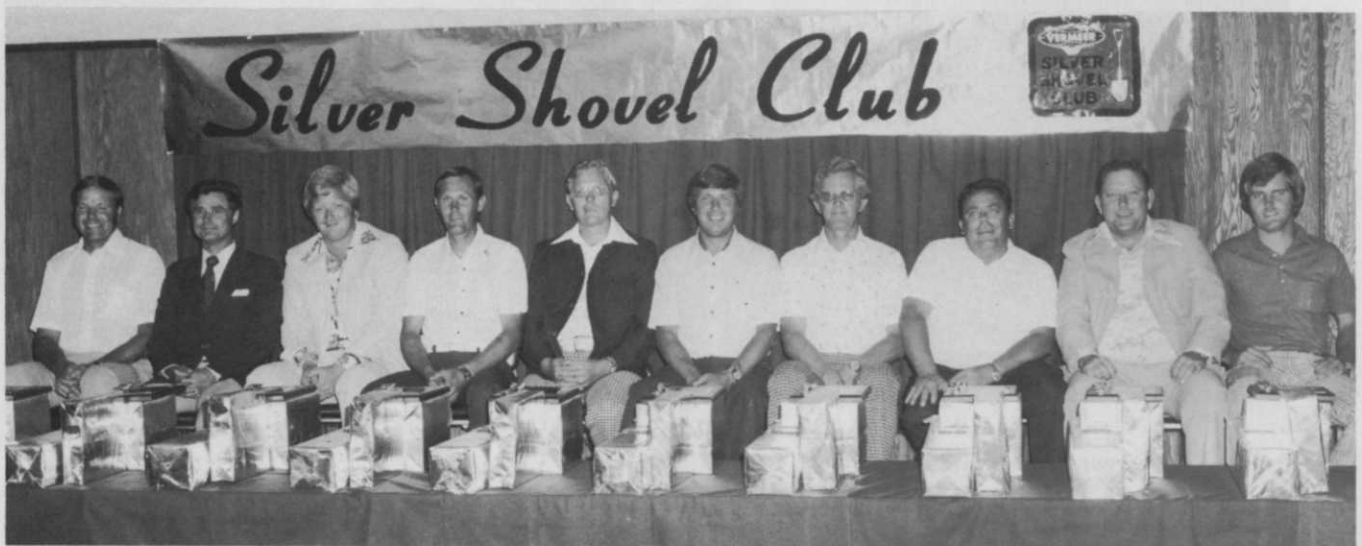
"California has by far the greatest acreage of drip irrigation in any state," said irrigation and soils specialist Albert W. Marsh in explaining the choice of UCR as an information center.

"And Southern California has the greatest concentration in the state," he added. "Research on the process has been done mainly by people from this campus plus farm advisors and specialists in the counties. Riverside is the most logical place from that standpoint."

Since drip irrigation has been employed in the U.S. for little more than 10 years, information on its use will probably be limited to journals, monographs and commercial periodicals. Agriculture experiment stations in all 50 states and experts throughout the world are being contacted for materials.

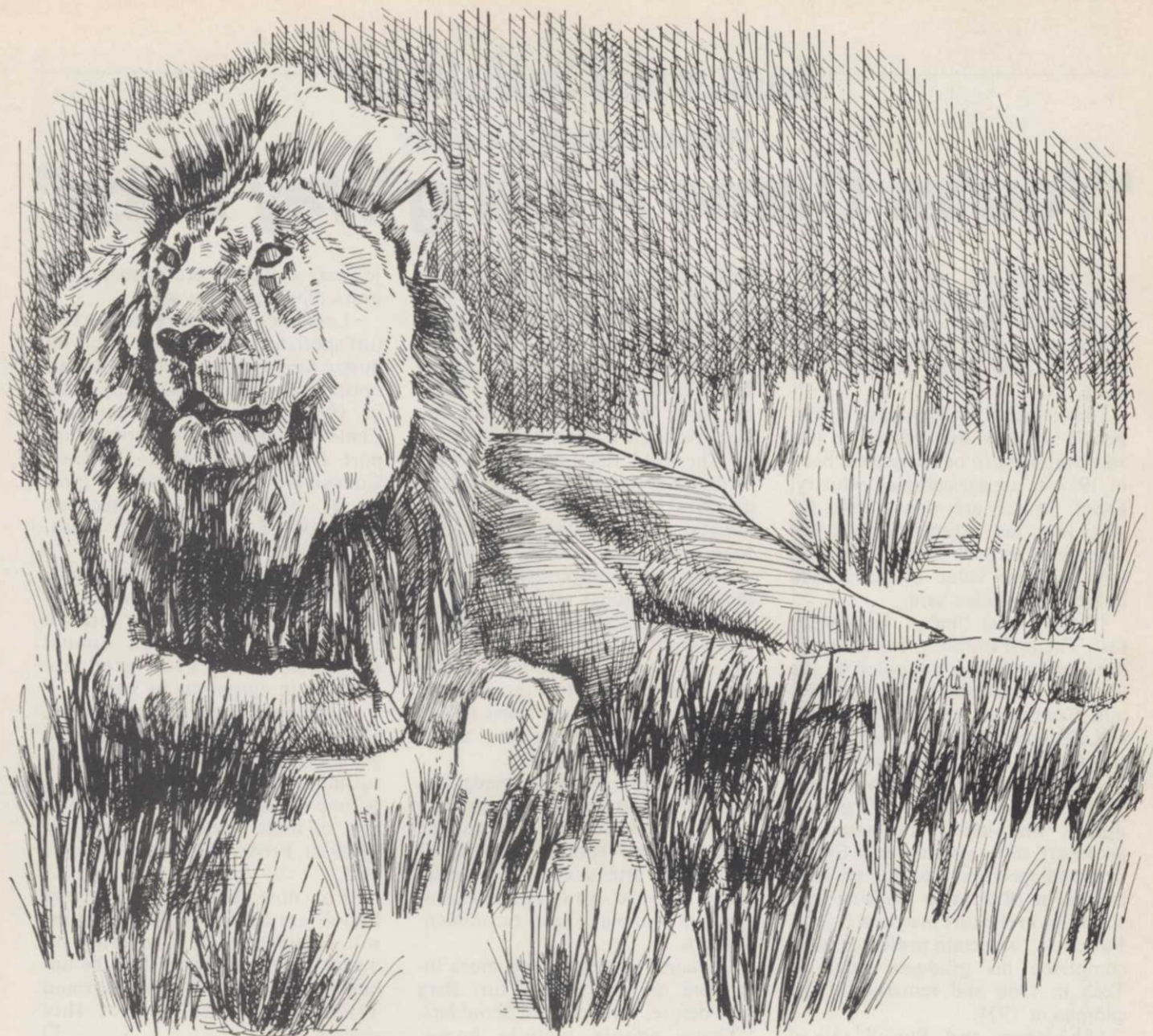
Developed after World War II strictly as a greenhouse watering system, drip irrigation was first expanded on a major scale in Israel in the 1960s, where available water was limited. UCR soil scientist Sterling Davis initiated experimentation in California in 1963 on two citrus orchards in Southern California.

Today, some 50,000 acres in the
(continued on page 38)



Ten Vermeer sales and service representatives were honored recently at the National Silver Shovel Awards banquet held by the Iowa-based firm. Named as charter members of the new sales club were: Leroy Jones, Noblesville, Indiana; Kevin Klein, Findlay, Ohio; Bob Cramer, Arvada, Colorado; Ron Herford, Olathe, Kansas; Mel Vander Schel, Eureka, Illinois; Bill Zigterman, Batavia, Illinois; Jerry Hilgenberg, Batavia, Illinois; Larry De-

Bruin, Pella, Iowa; Don Slagter, Pella, Iowa; and Ron Veenstra, Pella, Iowa. The awards which go to the top ten Vermeer salesmen of underground construction equipment throughout the U.S., were presented during a national sales meeting held in Des Moines, Iowa. Vermeer, headquartered in Pella, Iowa, manufactures and nationally markets a complete line of trenchers, vibratory plows and tree handling equipment.



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Commercial Sod Industry

Virginia's Turfgrass Industry

"You've Come A Long Way Baby"

GLANCING at a turfgrass program dated August 1957, Virginia Tech agronomist John F. Shoulders smiled broadly as if to say, "You've come a long way baby."

The "baby" in this case is Virginia's turfgrass industry which just was beginning to be recognized back in 1957 as an agricultural industry. Exact figures are unavailable for that year but estimates place the acreage of all turf at about 200,000 with a gross value of about \$40 million, Shoulders said.

Today, that "baby" is growing fast. The turf industry, based on the most recent figures compiled by the Virginia Department of Agriculture and Commerce, presently includes 618,000 acres under cultivation with income at \$524 million annually.

"That's nearly as much acreage as there is in corn in Virginia," mused Shoulders, an associate professor of agronomy and Extension turf specialist who joined Tech faculty in 1952. Also working as a specialist in the turf program is A. J. Powell Jr., associate professor, who completed his graduate work at Tech in 1966 and returned to the campus in 1971.

Shoulders and Powell talked about the 19th annual Turfgrass Field Days and Trade Show recently held at the University. Since its inception, the event has grown from fewer than 50 participants to almost 300 at the 1975 program.

Traditionally held on the campus in September, the event this year was held in the spring instead, to beat the summer rush to the golf greens managed by many of the golf course superintendents for whom the program is designed to assist. The Tech agronomists also wanted to show the effect of the spring stress on grass.

Another change that the agronomists noted in this year's turfgrass program was the expansion of the traditional exhibit of turf equipment and materials into a

trade show, featuring the latest in professional turf machinery and materials by some 20 companies.

To accommodate the trade show, the event was moved from the Turfgrass Research Center to nearby Lane Stadium, where Virginia Tech football is the usual fare.

The field days continued their tradition of tours of experiments in progress on turfgrass species and varieties, fertilization, herbicides, fungicides, and other work involving turf management practices, the turf specialists said.

The field days combined with the trade show making the event one of the few within a 300-mile radius where professional turf growers and managers can find the latest in turf equipment and materials "under one roof," Shoulders said.

Special efforts were made this year to attract certain groups who have not traditionally attended the field days, and these efforts paid off in a higher attendance of commercial lawn people and agricultural workers who make lawn recommendations.

"People are becoming more interested in high quality turf than ever before," commented Shoulders. "These people include home-

owners as well as professional turfgrass managers," he said.

Looking ahead 20 years, the two turf specialists see a lucrative turf industry for Virginia. Evidence of this optimism is apparent at Tech, where in 1969 a Turfgrass Research Center was opened with strong support from the Virginia Turfgrass Council and area turf organizations. R. E. "Dick" Smith, associate professor of agronomy at Tech, directs the center.

The state's turf organizations, Shoulders said, are investing in the state's turf future not only through the center but through annual scholarships to Tech graduate students in agronomy as well.

Each year along about January, Virginia's turfgrass and sod producers get together with Tech agronomists to compare notes and to map strategies for the future. The next of these meetings will be Jan. 28-29 at Fredericksburg, Shoulders said.

For now, both Shoulders and Powell are confident that turfgrass will continue to be a growing industry in Virginia and that the annual Tech Turfgrass Field Days and Trade Show will reflect this growth. □



Houston B. Couch (right with clipboard), professor of plant pathology and physiology at Virginia Tech, discusses turfgrass disease control with participants in the 19th annual affair.



A comparatively smaller mowing unit, capable of close mowing around trees was among several units displayed by the 23 exhibitors at Tech's 19th Turfgrass Field Days and Trade Show.



This large mowing unit was demonstrated before the 300 people attending the show. Tech's Lane Stadium is in the background.



A turf supplier (left) describes his products for two turfgrass managers attending the show on the Blacksburg campus.

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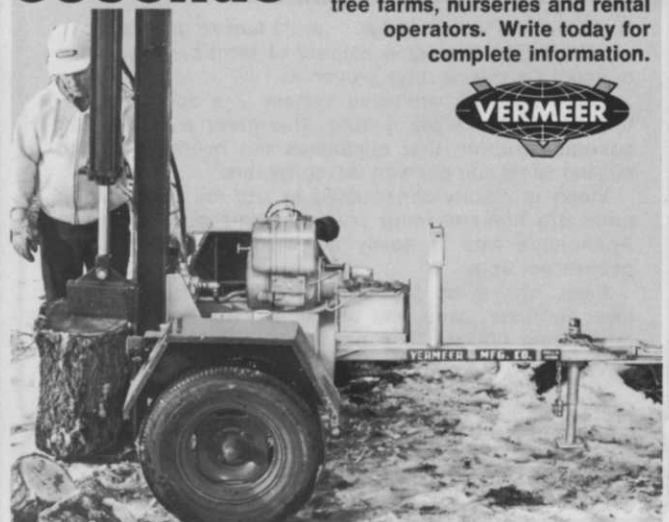
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NEWS (from page 34)

state are devoted to drip irrigation, with more than 100,000 expected to be using it in five years. No other state or foreign country approaches that volume, though Australia, Israel, Mexico and Hawaii have been world leaders.

The high frequency of irrigation allows highly saline (salty) water to be used, and in much smaller amounts than trench irrigation methods. Weed growth is minimal because water tends to be pinpointed near each plant, areas between rows stay relatively dry, and labor is reduced since valve adjustment is all that's necessary to maintain the system.

Though operating costs are reduced, equipment investment remains rather high and usage will necessarily be limited to "high-value" crops, like avocados and fruits, according to Marsh.

"Where water is expensive and limited, however, this will work," he added.

Locating the drip irrigation information center at UCR was the idea of Davis, an agricultural engineer for the U.S. Department of Agriculture. It will be housed in the Bio-Agricultural Library in Batchelor Hall.

Mount Sinai's Al Dennis Heads Turfgrass Council

Alan Dennis, grounds maintenance supervisor for Mount Sinai Memorial Park, Los Angeles, has been elected 1975-76 president of the 660-member Southern California Turfgrass Council.

He was installed during a recent council meeting in Los Angeles. Dennis succeeded Alfred N. Nobel to the post. The latter is a sales representative for B. Hayman Co., Inc., Santa Fe Springs-based distributor of turfgrass maintenance equipment.

Other officers inducted were: 1st vice-president, Sydney H. Gordon, Wilbur-Ellis Co., Los Angeles; 2nd vice-president, Charles F. Rei,

Pacific Sod Farms, Camarillo; secretary, James G. Prusa, Mesa Verde Country Club, Costa Mesa; and treasurer, John F. Culbertson, Pacific Sod Farms.

Directors for the coming year will be: Quentin N. Crowell, Brentwood Country Club, Los Angeles; Robert Davidson, Forest Lawn Memorial Park, Glendale; David Mastroleo, Hillcrest Country Club, Los Angeles; and Nobel.

The council conducts regular monthly educational meetings throughout the year, co-sponsors the Spring Turf and Landscape Institute with the University of California Cooperative Extension, promotes special educational seminars as the need arises, contributes funds for turfgrass research programs at the University, and stages the annual Southern California Turfgrass Equipment & Materials Educational Exposition. This year the show will be held October 22 & 23 on the Orange County Fairgrounds in Costa Mesa.

Grounds Management Society Elects Officers, Directors

The 1975 annual conference of the Professional Grounds Management Society (PGMS) adjourned with the installation of Allan Shulder as President.

The conference, which was held in Williamsburg, Virginia, September 2 to 5, marked the end of the two-year terms of the Society's three primary officers, the installation of new officers and a turnover in three of the nine board of Directors positions.

Shulder, grounds supervisor of the Greater Baltimore Medical Center and past PGMS Treasurer, replaces Harleigh R. Kemmerer as PGMS President. Kemmerer is grounds manager of Princeton University.

Newly elected Vice-President Charles Francis Lay, who is administrative chairman of the Arlington County Branch of the Virginia Polytechnic Institute (VPI) Extension Service, relieves past vice-president Charles L. Hall, Jr. of his duties. Hall also works with the VPI Extension Service, in Fairfax County, Virginia. Filling Shulder's treasurer post is Tom Lepping, landscape supervisor for the County of Oakland, Department of Facilities and Operations in Potomac, Michigan.

A busy, four-day conference program was filled with educational seminars on topics such as pesticides, fertilizers, plant growth, equipment maintenance, and other subjects pertinent to the grounds maintenance field. A collection of the leading experts in the horticulture industry were on hand to lead seminars, or address the society on the specialized areas of their concentration.

Field trips into the conference backdrop of Colonial Williamsburg — a site lush with masterfully planned, well-manicured horticultural attractions that serve as settings for the colonial-period architecture — were welcome escapes from the Conference rooms.



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Do Anti-Transpirants Improve Transplant Success?

NURSERYMEN didn't write the last word on transplanting when they developed balling and burlapping tree roots. T. T. Kozlowski, University of Wisconsin forestry researcher and some associates have just concluded research that reinforces common transplant practices in some cases but bursts other common transplant beliefs.

"Trees undergo large water deficits even if they are not moved," explains Kozlowski. "But if they are moved . . . the danger of desiccation (drying out) and death is very great." Kozlowski said nurserymen must move away from the attitude that balling and burlapping are the final answers to transplanting problems. A tree's physiology and water needs are far more complex for such simplistic solutions.

Transplanted trees have a better chance to survive and maintain healthy growth if transpiration can be reduced, water absorption increased, or both. Water absorption can be improved by proper transplant timing, handling, root preparation, and site preparation.

Transpiration can be reduced through anti-transpirants, chemical agents that hinder water release by treating the stomata of the leaves. These treatments reduce the tree's water needs by limiting water loss during the stressful transplant period.

Anti-transpirants come in two forms. Film-types coat the stomata, physically reducing the water loss. Metabolic anti-transpirants work internally to induce stomata closure. These two types have limited applicability for all trees. When using an anti-transpirant, Kozlowski recommended nurserymen approach each species and experiment, keeping in mind the toxicity potential.

Toxicity varies depending on variables like type and brand of anti-transpirant, dosage, species, soil conditions and temperature at application time. Anti-transpirants may cause reduced photosynthesis, altered metabolism, leaf lesions, chlorosis and leaf browning and leaf fall and possible death.

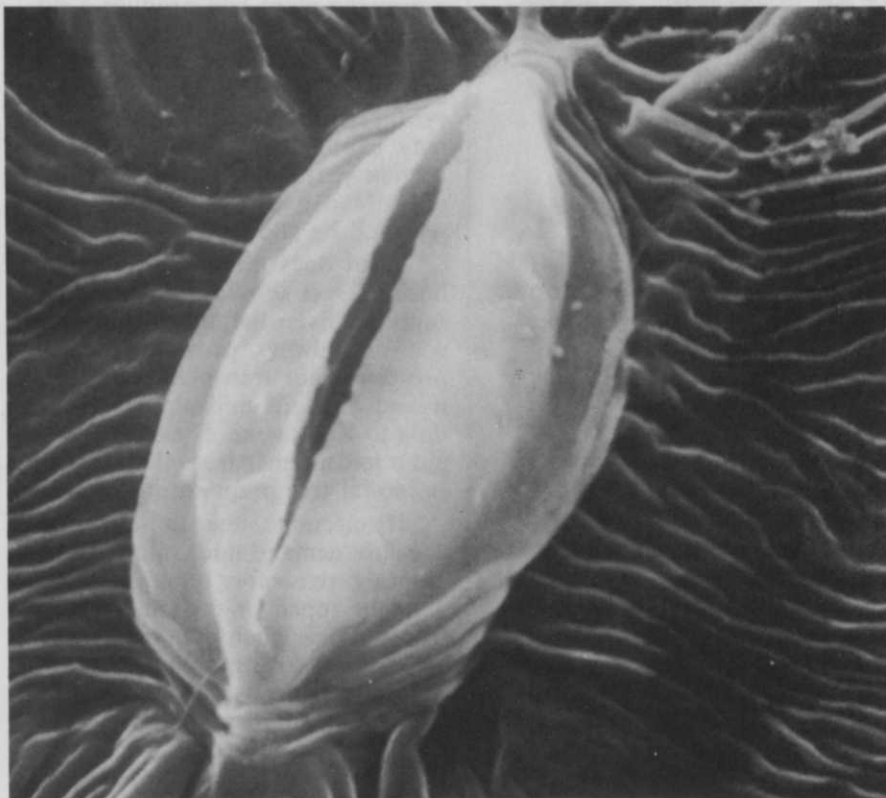
Pines and sugar maples, for instance, cannot tolerate certain film-

type anti-transpirants. The stomata are already partially filled with a or degrade. If sufficient numbers of stomata are blocked off, the tree dies. Kozlowski recommends "an anti-transpirant that isn't too efficient." In other words, an anti-transpirant that hinders but doesn't totally stop transpiration should be used.

All anti-transpirants do not have comparable results on all species. What works on broad-leaved species may prove to be detrimental to conifers. Again, each nurseryman should experiment with his own stock to find the best anti-transpirant for his region and needs.

Another limitation to film-type anti-transpirants is a decrease in efficiency at high temperatures because they tend to dry out and crack. Kozlowski's experiments showed "at high temperatures, very

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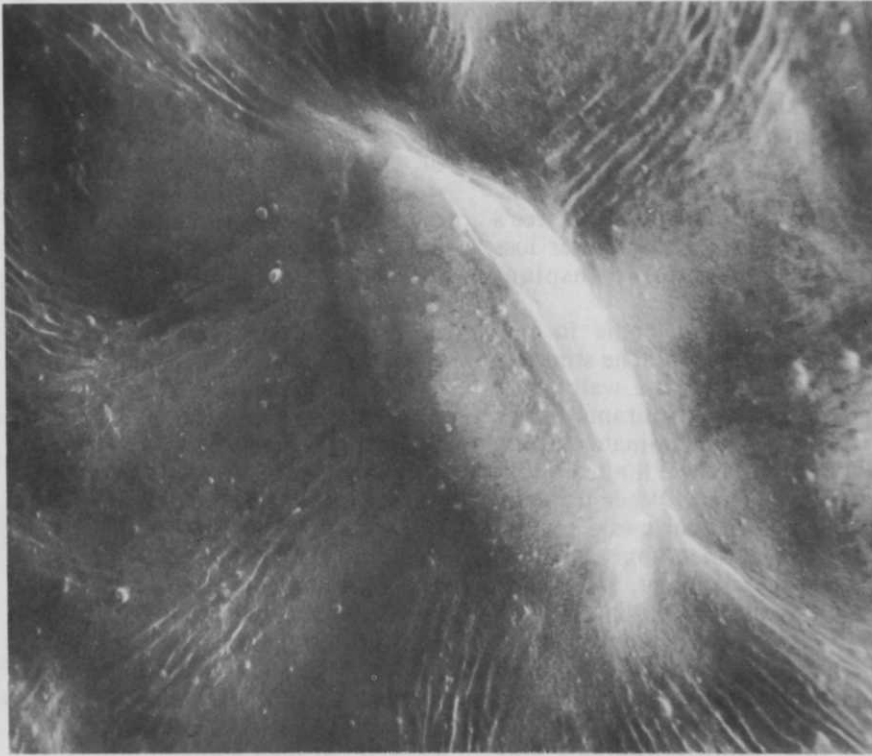
This photo shows the pore of an untreated ash leaf. The photo was taken with a scanning electron microscope (SEM).

HEADS UP!



March of Dimes

THIS SPACE CONTRIBUTED BY THE PUBLISHER



This is a scanning electron microscope photo of an ash leaf pore treated with a film-type antitranspirant. The pore is closed and moisture loss during transplanting is minimized.

waxy substance that protects the interior of the leaf. This wax and the anti-transpirant can combine to form a plug that does not wash away different results can be obtained with a given anti-transpirant under varying environmental conditions, from a 50 percent decrease in transpiration to a 50 percent increase”.

Wind may also effect anti-transpirant efficiency. In the field, high winds may disrupt the film and cause uneven spraying, resulting in leaf suffocation.

Metabolic anti-transpirants induce stomatal closure internally. The tested compounds had variable results ranging from outright toxicity to very satisfactory transpiration control. Kozlowski's research seems to indicate only one metabolic type, abscisic acid, was highly successful. However, this compound is not commercially available.

“Our studies underlined the difficulty of making specific recommendations for anti-transpirant use,” Kozlowski said. “Compound and dosage, species and environmental variables are important in determining the physiological responses of anti-transpirant application.”

“Anti-transpirant application to a growing plant will produce a different result than application to a plant that has completed its seasonal growth. Reduction of photosynthesis from anti-transpirants may cause death or influence the current year's growth or reserve accumulation for the following season,” he added.

What does this mean to the arborist? Trees shouldn't be moved in summer. Even the anti-transpirants will not always provide adequate protection for transplanting broad-leaved trees in midsummer according to Kozlowski. The only way to aid a midsummer transplant success is careful tree preparation.

If circumstance or customer pressure demand midsummer transplanting, remember to have a balled and burlapped or container grown tree to move. Then keep the number of branches to a minimum by pruning, be sure to use only light anti-transpirant applications and water to a depth of fifteen inches. After that hope for favorable growing conditions and you'll be on your way to reduced transplant losses.



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Handles many kinds of weed and pest control chemicals including wettable powder suspensions.

Available with solid shaft or with hollow shaft for direct tractor, truck, or jeep PTO mounting.

FEATURES:

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Suction & discharge ports tapped 3/4" NPT.

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