

MAY, 1969

WEEDS TREES and TURF



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WEEDS TREES and TURF[®]

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The Cover

Trained crew keeps loading time at a minimum for ROWCO, Inc., San Antonio, Tex., a contract applicator now operating in 11 states. On the cover are three key personnel of the company, all pilots. Left to right, they are: Luther Daniel, Sheldon Kosharek, and Jim Shaw, Frank Cady (see story beginning on page 6) is president of the company.



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Leave the Nursery Business to Us, Uncle

Nurserymen would consider Uncle Sam a much nicer "in-law" if he weren't a competitor. In fact, if he would increase his support of the nursery business through more research, he could become a favorite in a hurry.

This sentiment was expressed recently by Robert F. Lederer, executive vice-president of the American Association of Nurserymen. He testified Apr. 1 before a House subcommittee to urge that Congress discontinue appropriations for the Clarke-McNary Section 4 funds for tree planting.

The crux of the problem is that these funds are used to grow seedlings. Then large stocks are sold at a fraction of the going rate for commercial nursery stock. Example: On Mar. 12, Uncle Sam, through the General Services Administration, offered 2.3 million four-year-old Eastern Red Cedars and 150,000 two-year-old, twice-planted Rocky Mountain Junipers. Price: \$35 per 1,000.

Commercial nurserymen were offering products similar to the Eastern Red Cedar at \$130 per 1,000 for 9-12-inch seedlings; \$250 per 1,000 for 12-15-inch. The standard rate for Rocky Mountain Junipers is \$250 per 1,000.

At that price difference, it's tough for a fellow to make a living, pay Uncle taxes—and still like him.

We'd appreciate, said Lederer, that Congress consider diverting the more than \$300,000 that finds its way into large-scale production of nursery stock to research. Specifically, Lederer requested that it go to research toward controlling forest and tree pests and use of trees to improve the urban-suburban environment.

At the least, please don't sell nursery stock at those low prices.

"We know that forests and trees improve the human environment . . . act as natural air conditioners . . . enrich the oxygen supply and reduce carbon dioxide content of the air . . . muffle the cacophony of noises in the urban environment," he said.

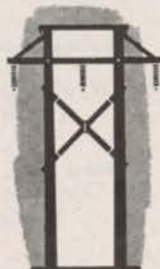
"We do not know which tree species are best for these purposes; which ones will best withstand the adverse conditions of soil, water, and atmosphere in the urban environment."

We'd appreciate, he concluded, your using that money instead to help us find out these answers.

Mr. Lederer's request on behalf of 1,700 commercial nurseries seems reasonable in order for Uncle Sam to be regarded as a government "for the people" . . . including those who are in the nursery business.

June

WEED & BRUSH CONTROL PLANNER



Timing Is Everything

June is the best time of year for basal spraying. Trees have used up most of the food reserves in their roots in order to shoot leaves.

At no other time of year will they be more susceptible to the basal spraying technique. This year get effective, long-lasting kill on those resistant species of brush with the basal spray technique . . . and the proper chemical from Amchem.

Use Enough Chemical

Chemicals are not as expensive as people. Sending a crew out without having them use enough chemical can mean another spraying, and resultant higher labor costs. How much to use? Apply enough chemical to wet thoroughly the basal portion of the tree until the solution puddles around the root collar.

What to Use in June

To get those hard-to-kill species of brush that resist conventional 2,4-D and 2,4,5-T formulations, use Brushkiller 170. It attacks brush with a double punch: through the bark and through the soil and into the roots. **Tip:** Where volatility is a problem near cropland, use Emulsamine® Brush Killer. It does not volatilize. Emulsamine Brush Killer is as safe as an amine and as effective as an ester. Both chemicals can be mixed with water or oil and both do the job. **Tip:** Use the basal spray technique to clean up regrowth in areas sprayed 2 years ago.

First name in herbicide research



See your Amchem representative for an individualized, month by month prescription for your weed control problems.

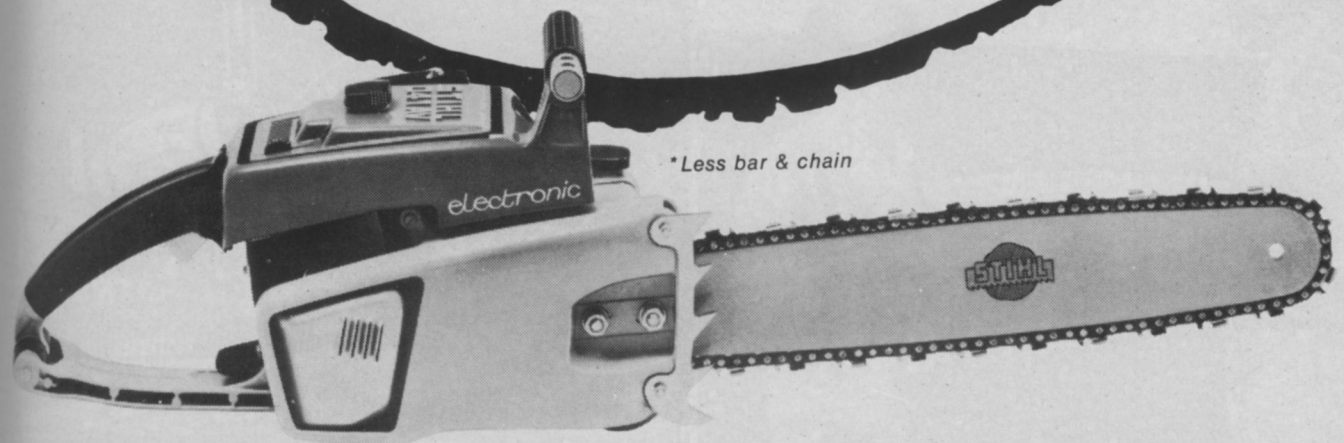
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In keeping with our policy of offering the most advanced and most dependable in chain saws — we have incorporated solid state ignition into the STIHL 041 AV Electronic Saw. Other than eliminating the need for points and providing a molded circuit that is impervious to moisture, dirt, and temperature extremes — this model offers big horsepower output coupled with a light 12½* pound weight and the fabulous new vibration absorbing AV handle.

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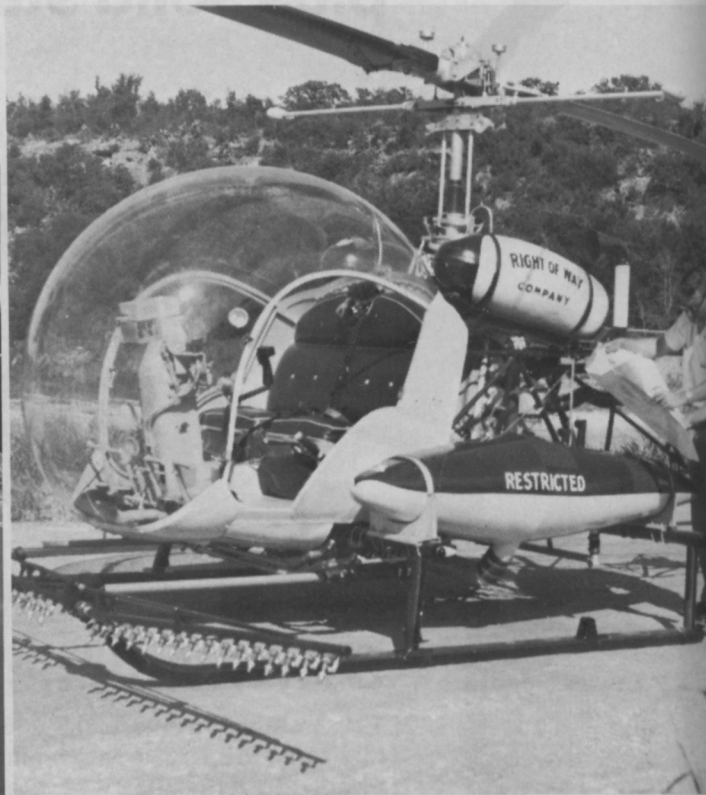
INVERT emulsions are being used more and more to place herbicides on target. The problems of drift are being solved as new equipment, thickeners, and invert formulations become more readily available in the market.

A veteran rights-of-way helicopter sprayman, Frank Cady, San Antonio, Tex., has been in this business since 1954. As the former manager of air operations for Stull Chemical Company, he was instrumental in the helicopter adaptation of the Stull bifluid system. Cady, now president and owner of ROWCO, Inc., (Right-of-Way Company), was among the first in the nation to use the helicopter for power line brush control spraying. Even today, this type operation accounts for 99 percent of his contracts for herbicide application.

Chief advantage of the invert emulsion for Cady is help in targeting herbicides from the helicopter 75 feet above ground to a right-of-way below, and at the same time controlling drift. The invert emulsion is based on water-in-oil. In short, the oil (a ratio of one part of oil to up to 14 parts of water) surrounds the water droplet. This helps eliminate evaporation and aids the droplet in holding its shape and size during the flight from spray boom to weed surface. Also, the controlled

Right-of-Way Spray Control

Invert Emulsions Help Target Herbicides



Frank Cady, left, and Richard E. Fields, manager of field development and research for Velsicol Chemical Corporation, Chicago, discuss the use of Banvel on Bundick Lake. In the picture at right Cady discusses the spray plan with pilot Jim Shaw.

droplet size serves to overcome drift caused by wind.

First use of the present-day Stull bifluid system was made by helicopter in 1959. Shortly thereafter, the same system was applied to ground equipment and with certain refinements has become common for both types of pesticide application.

Neutral spray adjuvants (Stull Bivert Formulations) are used to produce the "invert" emulsions in combination with a variety of water soluble, oil soluble, or conventional emulsifiable herbicides which are on the market. With the spray adjuvants, it is possible to apply more than one herbicide at the same time or in the same formulation.

New Invert Installation

ROWCO, Inc., uses a relatively new invert installation. This consists of a mixing device in the suction side of the sprayer pump. Discharge of the pump proceeds through existing equipment. An additional storage tank to hold the oil phase of the emulsion is only about one-tenth the size of the regular spray tank. Only this small size oil holding reservoir is needed since mixing ratios average one part oil to nine parts water by volume.

Chief purpose for development of the system was to control pesticide drift. But in actual use, another big plus has been reduction in evaporation losses during spraying. Droplets tend to hold form during spraying, which results in an even spray pattern and droplet distribution.

Cady operates in 11 states, primarily spraying herbicides for utilities. His major contracts last year were with Louisiana Power and Light, Kentucky Power Company, Central Louisiana Electric Company, and a number of REA co-ops in Illinois and West Virginia.

The ROWCO helicopter crew normally consists of a pilot and two ground crewmen. Some crews may contain more than one pilot. Cady operates on the theory that careful pesticide application requires intense concentration. Normally, a pilot is spelled after 1½ to two hours of flying time. Cady points out that helicopter spraying is a broader business than just flying. A spray pilot, he states, must know both brush and chemical. Further, he believes

Bundick Lake, about 2000 acres, is being sprayed for aquatic weeds. In this type of project, Cady blocks off the lake and assigns a block to each pilot.





Invert emulsion enables ROWCO pilots to target herbicides on water or right-of-way from up to 75 feet in the air and still control pesticide drift.

that three to four years of experience is needed under careful direction before a pilot can be expected to effectively manage both ship and spray program.

Pilot Training

In his own case, one of the three pilots who work for him was commercially trained. Cady, himself,

trained two of the men. All are FFA certified and have passed the necessary examinations for pesticide application in the states which have such requirements. For example, Mississippi, Arkansas, Louisiana, and Texas, where ROWCO has contracts, require pilots to pass a written examination. Further, the aircraft must pass a regular inspection.

Cady uses Bell 47-G helicopters and changes engines every 600 hours. With the exception of changing engines, all maintenance is handled by Cady and his crew. His is an FAA approved repair station and the pilots rework helicopters during the winter months.

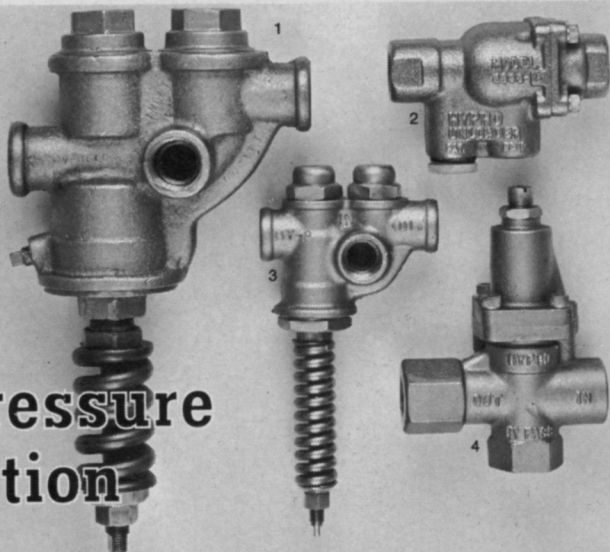
During this period, Cady spends his own time largely in lining up the coming work season. He likes to allot three months of the year in selling contracts and scheduling.

When contacted, Cady was spraying Bundick Lake for aquatic weed control. This was a project of the Louisiana Wild Life and Fisheries Commission supervised by Biologist Louie V. Richardson, Tioga, La. Richardson reported that hyacinths were first noted on the lake in 1964. A year later, more than 25 percent of the lake was covered. Normal application by mobile spray crews using boats failed to control the infestation.

Air Application Needed

Since only a portion of the hyacinth reproduction could be controlled, Richardson decided the so-

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THE STULL BIFLUID SYSTEM

Background. The Stull Bifluid System is a scientifically and commercially accepted method for the preparation and application of water-in-oil (w/o) and oil-in-water-in-oil (o/w/o) emulsions. Following is a graphical representation of the basic emulsion types utilized in most pesticide applications today:

BASIC EMULSION TYPES

"INVERT"
WATER-IN-OIL



OIL SURROUNDS WATER

KEY:

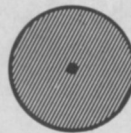


"COMMON"
OIL-IN-WATER



WATER SURROUNDS OIL

"MULTIPHASE INVERT"
OIL-IN-WATER-IN-OIL



OIL SURROUNDS WATER SURROUNDING OIL

Advantages of W/O and O/W/O Emulsions. Water-in-oil and oil-in-water-in-oil emulsions possess certain distinct advantages over oil-in-water emulsions for pesticide applications:

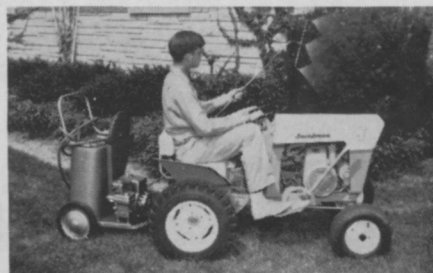
1. Less Evaporation Loss
2. Less Spray Drift
3. Less Run-off Waste
4. More Rain Resistance
5. More Surface Coverage
6. More Surface Absorption
7. Pesticide Chemicals Can Be Placed In Any or All Phases.

lution was a massive application by air using a drift limited carrier such as the invert emulsion. This led to the contract with ROWCO, Inc., and Cady. When the spraying began, Richardson estimated that the infestation had grown to a range of 50 to 800 million hyacinth seeds per square acre of lake.

In one area of 70 acres, Banvel-D was used with disel and invert. (Results of this trial will be published in WTT when they become known).

Richardson carries a regular program of aquatic weed control on Louisiana lakes. He has 22 two-man boat crews at his disposal. They are dispersed over the state to save travel and at the same time keep inland waters open.

Each crew is equipped with a lightweight pumping unit consisting of a rotary hydro-tractor pump and an air-cooled gasoline engine mounted on a wood frame. The unit produces a nozzle pressure of about 100 p.s.i. and does not normally cause fogging of the spray mixture.



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*St. Andrews Brought
Game to America*

81 Years Of Golf

ST. ANDREW'S GOLF CLUB—first in the nation and named after its parent and predecessor in Scotland — can be credited with fathering the golf industry the country enjoys today.

To visit St. Andrews today is to experience the deep traditions of golf. For St. Andrews members, golf has been both sport and common meeting ground for the leaders of American industry and government. For the golf course superintendent today, its 81-year history exemplifies efforts since the beginning of golf to establish, improve, and maintain playable courses.

When the St. Andrews group moved to Mt. Hope, only about six years after founding the club in 1888, one of its first concerns was planning and building a superior course. A young native of Scotland, Samuel Tucker, was serving as pro at the time and doubling as caretaker of the course. He was shortly joined by his brother, Willie, who

Golf Superintendent Roger Harmonay, left, and Dean Botjer, WTT advertising representative on tee apron overlooking the fifth hole at St. Andrew's Golf Club. Height of tee above hole is equivalent to a 20-story building.





Botjer, left, and Harmonay examine 0217 Brand Fylking sod which Harmonay has installed on 5th tee.

came to this country with some talent and experience in golf course architecture. Later, Willie Tucker became one of the well-known course architects of the country. Significant is the fact that the new golf club venture at this early point in its history—when members were few and the budget was crimped—recognized the necessity for placing a full-time grounds management employee on the payroll.

This tradition for operating a superior course now lies with Roger Harmonay, St. Andrews course superintendent, who joined the group in this capacity in 1961. However, Harmonay's association with St. Andrews started in 1939, when Roger was a 9-year-old caddy. He worked at this and at various club jobs during youth—later majoring in agronomy at the University of Massachusetts. Being a native of the area and after other golf superintendent positions, Harmonay found himself "home again" at St. Andrews Golf Club in Westchester County, near Yonkers, N. Y.

New Improvements

During Harmonay's 8-year tenure, he has built a new chipping green, rebuilt putting greens, built new tees, updated the irrigation system, developed a system of continuous drainage, carried a 5-year reforestation program to replace 97 large elms which the Club unfortunately lost (some 300 new trees have been planted), added cart roads, replaced traps with newly designed units, and sodded special areas.

In addition to these special course



Trap-edging is George Hirniak, a member of Harmonay's ground management crew.

improvement projects, Harmonay has developed a turf maintenance and improvement program which he

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Honored by American Horticultural Council "for demonstrating in a practical way that plants could be fertilized through their leaves; for being the first to develop and market an effective plant food for foliar feeding; and for opening the way to a new cultural practice in horticulture."

RAPID-GRO

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believes is especially appropos to the St. Andrews area. He places great emphasis on a winter fertilizer program, based on careful soil testing and interpretation. Soil samples are sent regularly each fall to Cornell University at Ithaca, N.Y., for testing. He coordinates the results of these with a summer testing program in which he uses a kit.

A late May flood two years ago invaded certain sections of the course and the resultant damage was certainly not included in Harmonay's work schedule. This flood boosted winter kill of turf from 50- to 90-percent above normal, with killing continuing until mid-August. An intensive reconstruction turf program put the course within 95 percent of normal by October.

Harmonay has a grounds management crew of six year-round employees. An equal number are added for the summer season. Winter duties require more help at this course because of a sophisticated curling rink and a full winter program. Harmonay uses year-round employees for the curling program as well as for winter maintenance and management duties relating to the golf course and equipment.

Greens Covered

Prior to the expected heavy freezes common to the Westchester County area, Harmonay sees that greens are covered with pine tree boughs and manure for protection.

He uses a mercury snow mold preventive on both greens and tees, and in addition on troublesome fairway areas. Harmonay figures a normal season's fertilizer treatment will include about 30 tons on the 160-acre course. The 18-hole course is a par 70, and a total of 6170 yards. This breaks down into 30¼ acres of fairway, more than 92,000 square feet of greens, and 54,000 square feet of tees.

Founder of St. Andrews was a

Harmonay chats with John Wood (right) of Yonkers, summertime helper, who has been fertilizing with a new Lily drill.





Mowing fairways and green aprons is John Gurka, using IH tractor and 7-gang Toro mower.

native Scotlander, John Reid, who had learned the game in his native land of Scotland. He secured some equipment (two sets of clubs) and invited some of his friends to join him in a nearby cow pasture. The common term of the day, "cow pasture pool," came into being as the U.S. pioneers of the game "went about playing the game with a determination and perseverance that must be admired." A published history of St. Andrews, which was a project of the Club in honor of its 50th anniversary, also notes that the

cow pasture location gave way shortly to the "old apple orchard," and later to Grey Oaks, a well-planned 9-hole course, before play began at the present Mt. Hope location in 1894.

Reid is not only known as the father of golf in this country, but St. Andrews began tournament play during this early period, and was a principal in development of the United States Golf Association, though when founded the name of the USGA was the Amateur Golf Association of the U.S., and still later

the American Golf Association. A Club member, Henry O. Tallmage, served as the first association secretary. John Reid declined the presidency of the new association and supported Theodore A. Havemeyer of Newport as the first president. Just 50 years later, in 1938, Reid's son, Archie, was elected president of the USGA.

Early Clubs

Early clubs of the era which enjoyed interplay with St. Andrews were Tuxedo (1889), Newport (1890), and Shinnecock Hills (1891). Countless others quickly followed these and today there are more than 9500 public, municipal, and private courses open for play in the U.S.

Traditional stories abound when members discuss the history of the St. Andrew's Golf Club. Noteworthy is the long accepted view that U.S. Steel was founded by Andrew Carnegie and associates during a round of golf, and at Carnegie's cabin which was located on the grounds.

The Club has survived two world wars which decimated its membership and a major depression. Today, strength is at an all-time high with some 250 members, all avid golfers. Another change is that rules have been relaxed to allow the ladies to use the course and dining facilities, a practice unthought of in the early days of this and similar clubs.

¹ H. B. Martin and A. B. Halliday, *St. Andrew's Golf Club*. Copyright 1938. St. Andrew's Golf Club.

Ladies now join men in play at St. Andrews, a relatively new innovation at this Club.



THE FIGHT against Dutch Elm Disease will be won in the laboratory is the motto and goal of Elm Research Institute, a national organization born of the increasing need to prevent the extinction of the stately American elm.

At the present rate of loss of a million elms annually, the species could be extinct in a single generation, leaving whole cities, parks and historic buildings barren of beauty that has been uniquely American since this nation's birth. Elm Research Institute, headquartered at Waldwick, N.J., is doing all it can to prevent this from happening.

Founded not long ago by prominent conservationists under the National Chairmanship of Governor Harold E. Hughes of Iowa, Elm Research Institute correlates the raising of funds and the fostering of research by qualified scientists whose ultimate goal is the development of a safe and practical control for the dreaded Dutch elm disease.

The non-profit Institute is financed solely by membership dues. Because all directors and executive personnel serve without salary, ERI is able to apply all of its resources to the purpose for which it was founded: finding the fastest and most effective way to control Dutch elm disease.

Elm Research Institute estimates that less than \$25,000 was spent last year on Dutch elm disease research in both private and commercial laboratories. Balancing this against an annual loss of a million elms shows how lacking these research efforts are. Time is running out, says ERI. To accomplish what remains to be done in time to save our elms, the full resources of science must be utilized, the Institute cautions.

ERI Grants

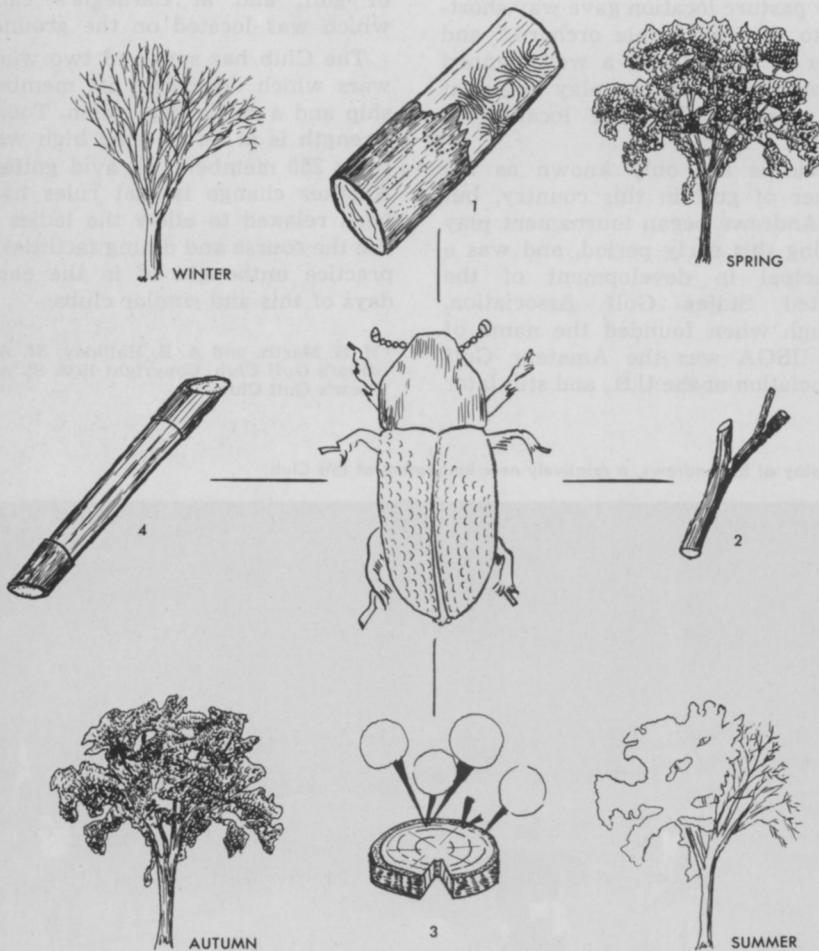
One major way in which the Institute combats DED is to give research grants to leading entomologists and plant pathologists. Research through ERI grants is now in progress in five of the nation's universities.

A three-year grant of \$30,000 to the University of Wisconsin involves research on altering the chemical code through which certain tree species either attract or repel feeding by specific insects. The university is also engaged in other control studies.

With a \$3,000 grant from the Institute, Michigan State University is breeding thousands of wasps destined for a "seek-and-destroy" mission among elm bark beetle larvae. The pupae of these wasps feed exclusively on the elm bark beetle lar-

Conservationists are fighting to stop
a million tree deaths a year

Elm Research Institute



The European elm bark beetle emerges in the spring from brood galleries through "slotholes" (Fig. 1) in the bark of an elm log. Feeding in healthy elms on one and two-year-old twigs (Fig. 2), these beetles introduce the fungus (diagrammatically shown in Fig. 3). As the fungus grows, it forms gums and resins that plug the vascular tissue (Fig. 4) causing wilting and subsequent death of the tree. The chief cause of spread comes from standing diseased elm in which the beetle overwinters.

vae. This natural beetle enemy represents by far the least expensive means of controlling beetle populations and, consequently, Dutch elm disease, the researchers reveal. Other beetle predators are also being sought.

Iowa State University is using its \$5000 ERI grant to study the responses in the tissue and chemistry of elms to infection by the pathogens of Dutch elm disease. It is hoped that this project will yield data on both the chemotherapy required to cope with vital responses and on the characteristics of resistance to disease.

An Institute grant of \$75,000 to be disbursed over a three-year period has been made to Cornell University to study and identify characteristics of DED-resistant strains. The objective here is to develop true American elms with natural resistance to Dutch elm disease.

Finally, a \$15,000 grant to New York University's School of Communications is being used to produce a film to dramatize the urgency for immediate support of the ERI "crash" program to find a control for the elm-killing disease.

What ERI Offers Members

Elm Research Institute offers its members a variety of free services, most of which are not available from any other source. These services range from counseling on every phase of elm care to field testing of new products for elm disease control by accredited experts, who deliver to member organizations objective and confidential reports without cost or publicity.

From its nursery of thousands of 3- to 5-foot elm seedlings, the Institute will furnish stock for replanting in any quantities to individuals, civic groups and municipalities for the cost of packing and mailing.

A Product Development service accepts ideas on disease control from any source, gives expert and confidential evaluation and puts innovators in touch with commercial or scientific agencies to further development.

Elm Research Institute also provides member garden clubs, civic groups, etc. with a talk and color film on elm conservation. It maintains an extensive library on elm disease control, from which members may request any available material.

The organization is also furthering the cause of the American elm by making available special stamps that can be affixed to business or

personal correspondence. These stamps that promote saving our heritage of elms can be purchased in any quantity from a single stamp (10¢) to pads of 196 stamps (\$10), according to the Institute.

Also available to members is a ten-minute speech that can be given to any group on how to save our elms through a nationally mobilized effort. The talk describes how unity of effort is being achieved through ERI and tells of the progress being made toward controlling Dutch elm disease. The New York University

film now being produced will also be available.

Institute members receive a Spring and Fall bulletin summarizing progress made and reporting new methods of elm conservation. They also receive periodic reports on the Institute's activities.

Williams College

An example of dedication to the cause of the American elm is quite evident in ERI charter member Williams College of Williamstown, Mass. Founded in 1793, here is one

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institution that has definitely not given up on the American elm.

"In my mind there is no other tree that compares with the American elm for suitability to a New England college," says Director of Physical Plant Peter P. Welanetz, who is also responsible for landscaping the campus. "It has beauty and grace, and, having a tall, slender trunk, provides shade without closing off views of the campus."

Welanetz believes that the Dutch elm problem can be minimized through a carefully planned, continuous program of care for healthy trees, detection of infested ones and quick removal of elms beyond saving.

Regular spraying, feeding and pruning are basic in caring for the 200 or so American elms on Williams' 450-acre campus, according to Welanetz. Surgery is also used. Weak spots in the wood that might be attacked by elm canker are cut and the cavity filled with concrete. Williams' program also calls for the transplanting of healthy young trees to replace those that must be removed.

Thinking of the future, Welanetz has begun an elm nursery. A hundred seedlings planted in the spring

of 1965 are reportedly thriving.

"We are going to continue our program," Welanetz promises, "and when an effective control of the disease is found, we will be far ahead, in terms of beautiful trees, of those who think the American elm is a lost cause."

ERI Members

Other institutional charter members of Elm Research Institute include Dartmouth College, National Audubon Society, University of Delaware, University of Notre Dame and Wisconsin Arborists Association.

Municipal members include: Bridgeport, Conn.; Elmhurst, Ill.; Kansas City, Mo.; St. Cloud, Minn.; Utica, N. Y.; and Wellesley, Mass.

Charter members of professional status include: Clapper's Tree Service, Crawford, Neb.; Lake Geneva Gardeners' Assn., Lake Geneva, Wis.; Lakeside Tree Experts, Barrie, Ont., Canada; Morrow Tree Service, Sewickley, Pa.; and Walgren's Tree Service, Hamden, Conn.

Elm Research Institute's Board of Directors consists of the following: R. G. Carmichael, Bettendorf, Ia.; Joseph Dietrich, Greenwich, Conn.; George Goodall, Portland, Me.; George Hafstad, Middletown, Wis.;



Such a small beetle making such a small bark pattern (above) as it overwinters can cause such a large tragedy, as the picture at right attests.



Edwin S. Irish, Warren, Mich.; J. A. Kimmel, Toronto, Ont., Canada; Curtis May, Beltsville, Md.; John G. Michalko, Cleveland, O.; Walter P. Morrow, Sewickley, Pa.; Carl J. Schiff, New York, N. Y.; Maunsell Van Rensselaer, Saratoga, Calif.; and Frank Vaydick, Kansas City, Mo.

Membership is open to all individuals, organizations and municipalities feeling a responsibility for safeguarding our national heritage of elms, says the Institute. Annual dues, which are tax deductible, are explained in the chart at right.

What Can You Do to Help?

In addition to joining ERI, you can plant elms to insure that there will be elms to save when DED control is finally achieved, the Institute urges. If you belong to a garden club, Audubon Chapter or any civic organization, you can support elm conservation, replanting and corporate ERI membership.

For membership applications or requests for more information concerning Elm Research Institute, write John P. Hansel, Executive Secretary, 60 West Prospect Street, Waldwick, N. J. 07463.

ELM RESEARCH INSTITUTE MEMBERSHIP APPLICATION

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10,000 to 50,000	1000.00	200.00	50.00
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* Includes all organizations, such as clubs, commercial companies, institutions, associations, foundations, etc. Categories describe scope of operations whether city-wide, state-wide or national.

** Life members hold membership for the duration of the corporation. Dues are payable upon acceptance of application and are in lieu of any other annual dues.

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Florida's Charlie Johnson shows his airboat's flexible, plastic downspouts through which acrolien is released into lakes and canals. Spouts are wrapped in springs to keep them pointed downward.

'CREEPING CHARLIE' Uses Aqualin to Kill Aquatic Weeds

BIG VOLUME business awaits the weed control contractor who can do aquatic weed work. This is the opinion of Charlie

P. Johnson, owner of a Miami, Fla., lawn spraying firm and a pioneer in Florida in weed control contracting.

Johnson has demonstrated his confidence in the future of aquatic weed control contracting by assembling a \$12,000 combination of airboat, trailer and truck, specially designed for combatting aquatic weeds.

The airboat, named "Creeping Charlie," is equipped primarily for the application of aqualin, manufactured by Shell Chemical Company. It is used to reach submerged weeds, but Johnson also finds it effective against all forms of algae. The unit replaces an earlier experimental airboat which was a regular boat powered by an aircraft engine.

The airboat hull, of a type favored by Florida hunters and fishermen, is 12 feet long, 5½ feet wide and made of fiberglass. At low speed and loaded, it pulls about eight inches of water. Because of the hull design, Creep-

ing Charlie can maneuver well in lakes or canals which are clogged with weed growth. Like all airboats, it simply skims over the top.

Lycoming Power Plant

Power plant for the airboat is a Lycoming aircraft engine generating 120 horsepower. In the center of the hull are twin tanks. One contains acrolein in a 53-gallon pressure cylinder which can be exchanged for another cylinder when exhausted. This exchange of tanks is the only handling required for the chemical supply. The second tank at the center of the boat contains carbon dioxide, which is used as a propellant to force acrolein through the flow regulator and the line which supplies chemical to a rear-mounted dispensing boom. Flow regulator is mounted at the front of the boat, under the eye of the operator. The herbicide moves from its cylinder tank through the flow meter in plastic tubing, then into



This flow meter, which shows how much herbicide is entering the water, is in the operator's constant view at the front of the airboat.

1/2-inch copper pipe at the floor of the boat.

This pipe carries the acrolein through the transom and on to the six-foot copper boom at the rear. The boom has four downspouts of 1/2-inch plastic tubing. These extend about eight inches below the surface of the water for expulsion of the acrolein gas. Tubing is flexible in case of an obstruction. Downspouts are encircled with steel springs to keep them aimed into the surface unless bent by an obstruction.

"At six miles an hour we get excellent coverage and there is just enough wake to fold in the acrolein," Johnson states. The boat makes a 6-foot swath on each pass but chemical covers an additional three feet on either side. Thus, each pass actually covers 12 feet in width.

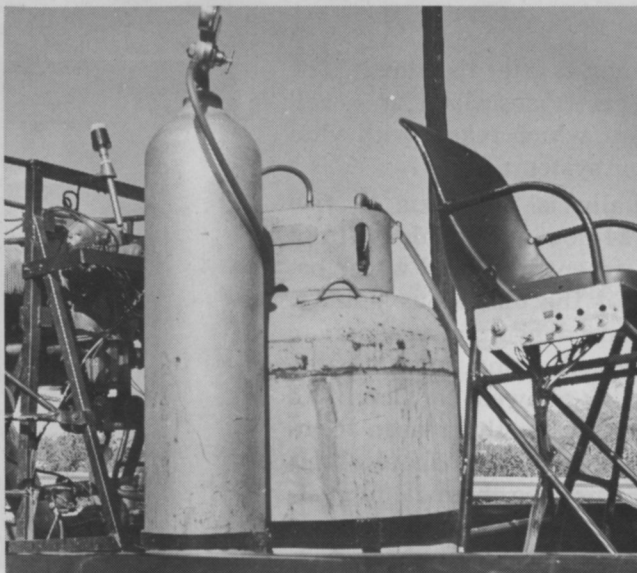
Johnson uses this applicator system to treat elodea, hydrilla, chara, pond weed, Southern naiad, cabomba, and all forms of algae. It is not used for water yacinths or for weeds emerging above the surface. While the airboat system is designed for one particular method of application, it is adaptable to spraying on or near the surface with other chemicals and for broadcasting dry chemicals.

No Fish Kill

In a recent lake-clearing program for a home owner's association, Johnson reported a complete absence of fish kill. This was accomplished by strip treating. He first treated only half the lake. Fish moved out of the section being treated and a few days later, he was able to treat the remaining half. In this instance, home owners wanted the lake cleared of weeds so they could again boat, ski, fish, and swim.

One characteristic of acrolein, according to Johnson, is that the chemical causes treated weeds to sink to the bottom and decompose. No mass of vegetation must

Squatty 53-gallon holds acrolein; taller cylinder at left is for carbon dioxide, which forces herbicide through feed line into the water. High seat for operator is at right of photo.



Johnson directs his driver in the launching of "Creeping Charlie" into the man-made lake being cleared of aquatic weeds.



An engine and propeller made for a light airplane power Johnson's airboat. Guardrail keeps riders from getting too close to propeller.



"Creeping Charlie," releasing herbicide underwater, skims over lake's surface.



be removed after treatment. The chemical is described as a cell toxicant which reacts with vital enzyme systems.

Aqualin is not toxic to fish after 24 hours. Animals will not drink recently treated water because of the obnoxious quality. There are dangers in application, an example being when treated water is allowed to flow into crop areas. For this reason Johnson feels legislation should limit use of this type chemical to qualified and licensed contractors or applicators.

Only Two Contractors Licensed

At present, Southern Mill Creek Products, which distributes aqualin in Florida, has licensed only two contractors to apply the herbicide, along with governmental agencies.

Part of the application system being used by Johnson includes a trailer to transport the airboat from one site to another, and a one-ton pickup truck, complete with four-wheel drive and snow tires.

Training is needed for job estimating, job planning, and in treating, Johnson says. Acrolein is being applied at rates of five to seven ppm of water. Thus, a careful analysis is needed regarding inflow and outflow of water, turbulence, and other factors.

Johnson works closely with the Hyacinth Control Society, Inc., which serves as a training agency, through regular meetings. This Society serves commercial applicators, flood control personnel, U. S. Army Engineers, mosquito control agencies, county and state officials and others. Research on aquatic weed control materials and procedures receives high priority at the U. S. Department of Agriculture field laboratory at Plantation, Fla., staffed by Dr. Lyle W. Weldon, research agronomist; Robert Blackburn, botanist; and Dr. Carey Stewart, plant physiologist.



Beautiful it was along this Waukegan, Mich., street in this News-Sun photo on Aug. 3, 1962...

It's Freers Elm Arrester

FREERS ELM Arrester, a new product developed by Charles R. Freers, Muscatine, Ia., has been granted USDA registration on a regional basis. It is being marketed in Illinois, Iowa, Indiana, and Missouri.

According to Freers, extensive testing has shown that the new chemical compound will arrest the fungus of Dutch elm disease, after the tree has been partially affected. Freers says the product is applied by direct injection into the trunk of infected elms. Its function is to arrest the disease, and prevent spread of the fungus throughout the rest of the tree. In tests over a 9-year period, Freer reports that many trees have continued to live.

In a healthy elm, Freers reports, injection of the chemical will prevent DED from developing even though the elm bark beetle has carried the fungus to the tree. The product, he states, has been found to be most effective when booster injections are given about every two years. Elm trees which are heavily infected, however, cannot be saved. The chemical compound, being sold as Freers Elm Arrester, is not phytotoxic, nor does it adversely affect the beetle. Instead, according to Freers' report, the

chemical is selective in destroying the fungus which is carried by the elm bark beetle.

Effective spraying and good tree sanitation, as a preventive program, have protected many elms. This has been possible where the beetle has been controlled. But, once the tree has been infected with the fungus, survival is seldom the case. No treatments are in use which will control the fungus. This control has been the goal of Freers in development of his treatment.

Another case in point which Freers believes his new product can solve is infection of trees by root graft. Many elms, he believes, contract the disease as a result of transmission via the root system when roots of infected elms and healthy trees form root grafts underground. In such cases, spraying for the beetle is ineffective. But, Freers states, injection of Freers Elm Arrester can save the tree.

Evidence of DED in a tree such as "flagging" is a signal to use the new product, according to Freers. He believes that it no longer need be a sign that the tree is doomed.

Freers has been an arborist for more than 30 years and has operated the Freers Tree Service of Muscatine. He spent almost a decade in development of the product and in experimental work and testing. The last three years, he states, have been most important. It was during this period—on a federal test plot and following the USDA requirements for evaluating the effectiveness of products claiming use in the

to Prevent This



then Dutch Elm disease paid its ugly visit, leaving this scene on Feb. 25, 1969.

cure, control, or arrest of DED—that the product proved to have arrestment capability. Now that federal registration has been granted in four states, he expects similar registration in other states soon.

Freers has formed a corporation in Iowa known as The Freers Company of Muscatine. His firm will be involved in manufacturing the chemical, selecting franchised applicators, training such applicators, and administering the entire field franchise operation.

Hercules Predicts Growth In 'Visko-Rhap' Usage

Because "Visko-Rhap" herbicides provide effective control plus low drift, their already wide-spread use will expand even more in 1969, says Hercules, Inc., Wilmington, Del.

Developed by Hercules' Agricultural Chemicals Division, Visko-Rhap herbicides are special formulations of 2,4-D, 2,4,5-T, combinations of these, and silvex. They deliver a thick, regulated spray that resists wash-off and evaporation, according to Hercules, and not only clings to but penetrates leaf surfaces. Because of their mayonnaise-like thickness, Visko-Rhap formulations don't drift off target when applied, Hercules says.

The herbicides, applied by ground, air or aquatic equipment, can be used on county roadsides, utility rights-of-way, in drainage control districts and on various crops.

Pennsylvania Group Elects Grau Executive Director

Dr. Fred V. Grau, long active in the turfgrass industry, has been appointed Executive Director of the Pennsylvania Turfgrass Council, according to Council President Don Krigger.

His many achievements in the turf industry include helping to develop Merion bluegrass, Meyer Zoysia and U-3 bermuda and discovering and developing—with the aid of his late wife—Penngift crownvetch.

Grau's turfgrass career includes work at Penn State as Extension Agronomist, where he worked closely with the late Professor Emeritus H. B. Musser—pioneer in turfgrass research and education and formerly the Council's Executive Director. Grau was also consultant to West Point Products, to Nitroform Agricultural Chemicals, and to Hercules, Inc. Since 1965 he has devoted his full-time effort to Grasslyn, Inc., the firm he and his wife established.

Grau is a life member of the American Society of Agronomy and of the American Association for the Advancement of Science. He holds honorary memberships to several golf course superintendent associa-

tions and in 1954 was awarded the Distinguished Service Tribute by the Golf Course Superintendents Association of America. Last January he won the U.S.G.A. Green Section Award.

Neeley Reveals Pros, Cons Of Fertilizing Trees

Dr. Dan Neeley, Illinois Natural History Survey plant pathologist, pointed out both the benefits and drawbacks of fertilizing trees at the University of Maryland's Arborists' Day held in College Park.

Tree fertilizers serve four functions, he said: (1) spurring rapid growth; (2) improving tree's appearance; (3) retaining vigor and safeguarding against diseases; and (4) regaining vigor after damage by disease, drought, insect pests, mechanical equipment.

On the other hand, Neeley explained, fertilizing trees may have drawbacks.

"You will have to mow your lawn more often," he said. "You may need to prune more frequently. And you may actually decrease the amount of flowering or fall color. Some plants may develop a weepy appearance."

To decide whether or not to fertilize, Neeley suggests checking the growth rate of your trees and examining the condition of your soil.

Twig growth, he said, can be determined by comparing the amount of space between the first and second—or last two—sets of bud scale scars. Growth can also be checked by removing a plug from the trunk to see if the latest ring is wider or narrower than the previous one.

Soil should be examined for depth (the deeper, the better), texture, structure and sub-soil, Neeley explained.

If fertilization is in order, Neeley recommends an annual application of nitrogen in April or May at the rate of 6 lbs. per 1000 sq. ft. of ground. Phosphorus and potassium need to be added only at 3- to 5-year intervals at the rates of 3.6 lbs. per 1000 sq. ft. and 6 lbs. per 1000 sq. ft., respectively, he said.

For a free publication entitled "Fertilizing and Watering Trees," write Dr. Neeley at the Survey, Urbana, Ill. 61807.

**Next
Issue**

*J. R. Watson tells about
the science of mowing grass*

Specialists Review New Grass Varieties

In Brief:

New grass varieties are important to the turf industry. A feature of special interest at the recent Midwest Regional Turf Conference at Purdue University, Lafayette, Ind., was a review of new variety characteristics and promotion ideas by a panel of seed industry representatives. The material presented constitutes the highlights of data from each panelist.

0217 Brand Fylking

Jacklin Seed Company, Dishman, Washington, and Hogg & Lytle Seeds, Oakwood, Ontario, Canada, have been granted the exclusive right to produce and market the new patent variety Fylking Kentucky bluegrass by its Swedish developers. 0217 brand Fylking produces a turf with good color, density, hardiness, and at the same time a dwarf type which stands extremely close mowing. Fylking has a short leaf sheath, moderately prostrate leaf blades, and a fairly slow rate of vertical growth. It is recommended for golf tees and aprons and for general turf use on lawns and industrial sites. It shows resistance to both leaf spot and stripe smut. This grass which is becoming well-known was brought to this country some 10 years ago by Arden Jacklin, president of Jacklin Seed, and after extensive testing was introduced 2½ years ago to the commercial market. To date, seed distribution has been largely to professionals such as golf course superintendents and sod growers.

Sales representative and agronomist for Jacklin Seed, Doyle Jacklin, in discussing the introduction of Fylking, stated that \$300,000 in promotional expenditures will normally be expended in the first year's introduction and the following three years in putting a new variety on the market. This heavy expense, he believes, will act to limit the number of new Kentucky bluegrass va-

rieties to be successfully released and merchandised, both now and in the future. Jacklin pointed to Fylking as an example. He listed such requirements as breeding or selection of a variety which is unique and reproduces true to type; the increase of the variety for seed testing stocks; the distribution of seed samples to a representative group of testers; the compilation and evaluation of test data; a program for marketing procedure; and others. Registration of a brand is also desirable to protect and promote the investment. In short, Jacklin stated that five and possibly 10 years of investment will be necessary even before evaluation.

Once released, promotion, advertising, and marketing programs are necessary to establish the new grass in the industry. In the case of Fylking, Jacklin stated that it was first introduced to sod producers and professional turf men, with promotional material being made available. Even though seed has been multiplied and made available at a rapid rate, Jacklin said the Company is still unable to fully supply the retail trade. Limited supplies for this trade are just becoming available and will not be generally available until late summer this year.

Prato

Northrup-King & Company representative, Howard E. Kaerwer, discusses that company's relatively new variety, Prato. This is a vari-

ety developed in the Netherlands and extensively used in Europe and now in the United States, he said. Prato can stand short mowing and is dense. Internodes are short and rhizome buds are plentiful.

Northrup-King started screening special bluegrass varieties 18 years ago and selected Prato Kentucky bluegrass for use in the upper U.S., Kaerwer stated. It has shown a good history of performance, he said, and produces a heavy, plump seed, numbering about 1.2 million per pound. Establishment is similar, he said, to new varieties now being introduced. Prato produces short, prostrate seedlings, and develops an extremely tough sod. It has multi-leaves at the tillers and leaves develop close to the ground. No seed heads are produced in turf, which is a valuable asset during June.

Prato, Kaerwer continued, is reasonably free of leaf spot and is mildew resistant. It is moderately susceptible to rust and has little resistance to stripe smut, but still is superior to Merion in this respect. Though not particularly adapted to the hot climates, Kaerwer said that Prato is doing well in trials in California.

Fertilizer requirements for Prato are at a lower level than Merion. However with water and fertilizer, it develops a heavy, dense turf but goes dormant quickly if water is shut off. The variety has been developed for short mowing, Kaerwer said, and is commonly mowed at a ½-inch height in Europe. It can be mowed up to a 2-inch height, but recommendations are for ¾ to 1¼-inch mowing heights. It is compatible with other grasses such as Fylking, Park and Delta, though it is competitive, according to Kaerwer. Prato also does well with Ruby red fescue (a creeper) and is being used in the Eastern U. S. with the fine leaf ryegrasses, NK 100 and Pelo, he stated. Prato exhibits a broad leaf when first established (similar to Merion) but leaves later become more narrow and Prato produces an extremely fine textured turf. Seed is available, Kaerwer said, and is being further multiplied.

Warren's A-Series

Ben O. Warren, Warren Turf Nurseries, Palos Park, Ill., in reviewing the A-series of grass varieties developed by his company, presented a selection new to growers

(Continued on page 24)

Meeting Dates



Arizona Spring Turfgrass Conference, Tucson National Golf Club, May 12.

Central Plains Field Day, Central Plains Turfgrass Foundation, Research Plots, Kansas State University, Manhattan, Kan., June 2.

Turf Research Field Day, Rutgers State University College of Agriculture and Environmental Science, New Brunswick, N.J., June 11.

Michigan Association of Municipal Cemeteries, 9th Annual Conference, Holiday Inn, Traverse City, Mich., June 20-21.

Annual Meeting, American Society of Agricultural Engineers, Purdue University, Lafayette, Ind., June 23-25.

National Fertilizer Solutions Association, Round - Up Program, Ridpath Hotel, Spokane, Wash., July 8-10.

National Fertilizer Solutions Association, Round - Up Program, Hotel Muehlebach, Kansas City, Mo., July 22-23.

National Fertilizer Solutions Association, Round - Up Program, Marriott Motor Inn, Atlanta, Ga., Aug. 13-14.

Golf Course Superintendents Field Day, University of Rhode Island, Kingston, R.I., Aug. 20.

Lawn and Utility Turf Field Day, University of Rhode Island, Kingston, R.I., Aug. 21.

Turfgrass Management Conference, Hawaii Turfgrass Association, East West Center, University of Hawaii, Honolulu, Hawaii, Aug. 27-29.

Annual Turfgrass Field Day, Michigan State University, East Lansing, Sept. 4.

Lawn and Ornamental Days, The Ohio Agricultural Research and Development Center, Wooster, Sept. 9-10.

Central Plains Turf Conference, Kansas State University, Ramada Inn, Manhattan, Kan., Oct. 15-17.

National Fertilizer Solutions Association, National Convention and Equipment Exhibition, Cincinnati Convention Center, Cincinnati, Ohio, Nov. 9-13.

Note: Dates for this column need to reach the editor's desk by the 10th of the month preceding the date of publication in order to make the printing deadline.

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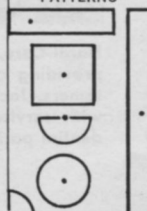
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Sod Industry Report

(From page 22)

and turf specialists alike. This was A-29#S-6, a promising low cut bluegrass. This specific selection, Warren stated, tolerated $\frac{3}{8}$ - to $\frac{1}{2}$ -inch mowing over a 5-year test period. Normally, the tendency, he said, is for outlaw grasses such as crabgrass and annual bluegrass to compete with low-mowed Kentucky bluegrasses. But such has not been the case with the new A-29 selection. Much is yet to be done, Warren said, to determine whether to develop A-29 vegetatively or via the seed route.

Warren also discussed A-10, A-20, and A-34. The theory behind the complete series, he said, is the fact that in selection work, a variety which fits all situations and locations cannot be found.

For example, A-10 is adaptable to the Ohio River Valley area, which is the southern range of the bluegrass area. Northern grasses really don't fit this area, Warren stated, but A-10 can stand the hot humid summer of St. Louis, yet still has some merit in more northern areas. It is a very dark green at all levels

of fertility, and has a more narrow leaf than average. Though is not as dense as some bluegrasses, Warren stated. Resistance to disease is fair and it has good resistance to hot area diseases. *Fusarium zoseum* resistance has been good in St. Louis and similar areas where franchise growers have been selling the selection as plugs. His company is going somewhat slow on A-10 at the moment because of minor disease weaknesses.

For shade areas, A-34 seems the best answer at the moment. It is easy to both grow and transplant. Problems have been apparent only when areas range to 90% shade or more. For turf areas with 65- to 70% shade, A-34 is superior, Warren said. This selection has also been doing well in sunlight areas in California.

Warren's A-20 is a good grass for all areas, Warren pointed out. Disease resistance is good; in fact, he stated that it is as good or better than Merion for four key diseases. The company currently has one million yards of this sod in the mid-west for sale this year. Plans are to promote A-20 on the East coast beginning this year. Test data, including growth data at Rutgers, indicate that the grass is adaptable for the area.



Paul Florence, Scotts

Windsor

Discussing Scotts' turf program was Paul Florence, manager of Windsor sod culture and marketing. He said that Windsor was a single clone selection made from a pony pasture in central Ohio, in 1949. This selection was entered into Scotts Bluegrass Development Program and propagated into selection and performance plots for evaluation and comparison with other turf

Hardi-Gardens, Inc., which only months ago began a nation-wide franchise program, recently announced it will establish 60 franchised garden centers in Texas, bringing the total of committed centers to 165.

Four centers are open in the company's Nashville headquarters; stores in newly franchised areas will start to open in early Spring, according to the company.

The garden centers carry over 15,000 items of living stock and feature a complete line of name-brand lawn and garden items, from plant foods to patio furniture.

"One of the beauties of our franchise plan is that the franchise need not have a special horticulture background to operate a Hardi-Gardens center," said company President Francis Galloway. "We offer a comprehensive course in garden center management and actual on-the-job training in one of our Nashville outlets. It greatly simplifies the horticultural and management aspects of the business."

Hardi-Gardens Establishes 60 Franchises in Texas



Hardi-Care, a new franchise concept developed by Hardi-Gardens, Inc., is currently providing complete landscape services for Nashville industrial and residential customers. Jack King (in dark suit), manager of the pilot Nashville operation, consults with servicemen Paul Bauman (foreground) and Don Martin, at work in a residential patio garden.

Conference Panelists



H. E. Kaerwer, Northrup King & Co.; Doyle Jacklin, Jacklin Seed Co.; Ben Warren, Warren's Turf Nurseries; Laurel Meade, Agricultural Alumni Seed Improvement Association.

varieties. Research data, Florence said, have consistently rated Windsor superior in (1) disease resistance, including the common bluegrass diseases such as leaf spot, rust, dollar spot and striped smut; (2) drought tolerance; (3) color; (4) turf density; (5) texture; (6) close mowing, performing well at clipping heights as low as $\frac{3}{8}$ of an inch; and (7) chemical tolerance, including the phenoxy herbicides, the mercurial fungicides and the chlorinated hydrocarbon pesticides.

In 1960, Florence stated, Scotts offered contracts to professional seed producers in the Pacific Northwest to produce Windsor seed. These producers were, and still are, paid a premium for seed meeting the contractual specifications.

Limited quantities of Windsor seed became available and test marketing at retail was initiated in 1962 under Scotts brand, "Gold Label Classic," a bluegrass blend. As the seed producers increased their acreage and yields, Windsor was marketed in a broader geographic area and in several additional Scott brands including pure variety.

The market place, Florence stated, determines the success of any new product. Last year, he said, Scotts spent several million dollars promoting lawn products to the consumer in the United States and in Europe. Windsor was an integral part of that program and as a result, sold over 3 million pounds of Windsor bluegrass seed in 1968. Windsor bluegrass was made available to the professional sod producer for the first time in 1964.

Scotts has developed a sod grower licensing program designed to

support the professional sod grower with technological assistance in production and marketing. The licensed grower is provided marketing assistance thru his co-op advertising fund, designed to broaden the Windsor market, and stimulate the sod market in general. Selling aids, Florence pointed out, include signs, banners and promotional literature.

Sodco

Sodco is a new dwarf variety of bluegrass developed at Purdue University. It was discussed by Laurel Meade, Agricultural Alumni Seed Improvement Association, West Lafayette, Ind., the organization which will promote and develop the variety in the market.

Meade said that the Foundation group owns and operates 500 acres of land in the area and also has a research farm in Florida. Foundation seed for Sodco was made with a trial University planting in the fall of 1968. A few thousand pounds were produced, he said, and will be expanded as rapidly as possible. The Purdue Research Foundation has applied for a patent for the new variety and has assigned distribution rights to the Association. Meade said that this latter group is working under a contract with Western seed producers to produce seed.

Sodco, according to Meade, grows slowly and low. It is resistant to striped smut. Leaf nodes are close together and the leaf blades have a horizontal growth habit. Whereas common bluegrass varieties are cut at one and a half to 2-inch heights, Sodco may be cut three-quarters of an inch to an inch in height, Meade said. This can bring

about a "manicured" look to lawns. Because it does not have to be cut frequently, thatch is reduced. However, Meade stated, there are some shortcomings. Sodco is not designed to withstand heavy play use or traffic. It is more a "picturebook" grass. It will do best, Meade believes, on front lawns with little traffic and on golf course fairways which receive excellent care and management. Sodco has been tested at several state agricultural experiment stations in the United States.

Warren's A-20 Bluegrass Has Five-Year Guarantee

Warren's Turf Nurseries recently announced that its new disease-resistant bluegrass, A-20, is guaranteed to grow within five years of the date of planting. The sod, however, must be planted and maintained in accordance with instructions specified by the company, according to Robert Warren.

The new bluegrass has proved to be rust and mildew resistant, as well as resistant to stripe smut and leaf-spot, says Warren. Its thick growth retards weed invasion, the firm contends. A-20 will survive close mowing to $\frac{1}{4}$ -inch and is therefore good for home putting greens and croquet courts, says Warren.

Dark green in color, A-20 Bluegrass makes a dense carpet-like turf but does not develop thatch as readily as most bluegrasses, the company says.

A-20 must be planted from sod or plugs; it is not available as seed. It is not guaranteed against damage by insects or traffic.



Deal Says Air Pollution Damages Annual Bluegrass

Air pollution hasn't been given proper blame for causing damage to golf courses and lawns, says University of Maryland Turf Specialist Elwyn E. Deal.

Plants show harmful effects to air pollution well before humans become uncomfortable, he reveals. An oxidant concentration of about 0.15 ppm is required for human discomfort, but plants begin to show harmful effects at one-third this concentration, Deal explains. Table 1 shows

the susceptibility of common weeds to air pollutants.

Perhaps a closer look at a relationship between air pollution, turfgrass and annual bluegrass around cities should be taken, Deal suggests. Many cases have been cited in which annual bluegrass has continued to die, often with few or no positive disease symptoms apparent and even after fungicides were applied.

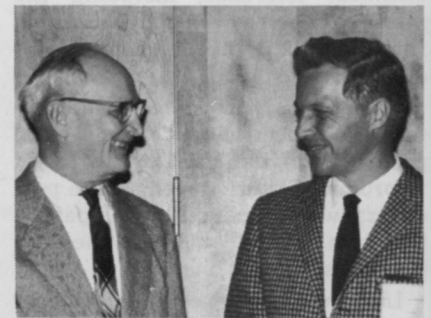
High temperatures that the plant cannot tolerate have been blamed for annual bluegrass injury in warmer urban areas, but perhaps a combination of weather and air pollution was the cause of damage, Deal says.

Table 1. Decreasing order of susceptibility of ten common U. S. weeds to three atmospheric pollutants (Benedict and Breen).

Sulfur dioxide	Hydrogen fluoride	Oxides of Nitrogen
*Chickweed	*Nettle-leaf goosefoot	*Mustard
*Mustard	*Chickweed	*Sunflower
*Annual Bluegrass	*Pigweed	*Annual bluegrass
Sunflower	Annual bluegrass	Dandelion
Kentucky bluegrass	Lamb's-quarters	Cheeseweed
Pigweed (Amaranthus retroflexus)	Mustard	Kentucky bluegrass
Cheeseweed	Kentucky bluegrass	Chickweed
Lamb's-quarters	Cheeseweed	Nettle-leaf goosefoot
Dandelion	Sunflower	Lamb's-quarters
Nettle-leaf goosefoot	Dandelion	Pigweed

* Significantly more sensitive than others in list.

New officers and Board of Directors for New York State Arborists Association are, left to right: front row, William Herrmann, immediate past president; Fred Micha, 1st vice president; Bill Cadwallader, 2-year director; Stephan Grant, 1-year director; Ira Wickes, Jr., newly elected president; back row, Fred Donovan, 2nd vice president; George Callaway, secretary-treasurer; Carl Lundborg, 3rd vice president; Jack Schultz, 1-year director; and Robert Kessler, 3-year director. Not shown are 3-year Director Douglas Campbell and 2-year Director Edwin Drabek.



William Herrmann, immediate past president of New York State Arborists Association, congratulates this year's president, Ira Wickes, Jr.

Calhoun Is Greens Expert

Charles Calhoun, consulting turfgrass specialist and golf course consultant of Ames, Ia., will have a hand in developing a new Story City (Ia.) golf course, which will be part of a large municipal recreation area.

Calhoun is currently developing grading specifications for tees, greens and fairways. Greens should be of modest contour to provide pleasing yet challenging conditions for the average or novice golfer, he says.

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For More Details Circle (101) on Reply Card



Reid A. Woodbury, General Manager of Woodbury Chemical Company's Western Division, addresses the first annual Turf Clinic for lawn and garden supply dealers, recently held in Denver. Woodbury described soils in the western states, for which his company's new "Envy" Lawn Fertilizer, soon to be introduced in the West, was formulated. Seated is Dale Garrett, member of the sales staff of the Chemical Division of CF&I Steel Corporation, manufacturer of "Envy."

Woodbury's 'Envy' Treats Alkaline Western Soils

Woodbury Chemical Company of St. Joseph, Mo., and Denver, Colo., is marketing 'Envy,' a new fertilizer especially formulated to treat the alkaline soil condition characteristic in the western part of the country.

Produced by CF&I Steel Corporation, Pueblo, Colo., Envy contains 17% nitrogen, 21% sulphur and 4% iron (up to 4 times the iron in other brands), the three chemically compatible ingredients necessary for turf development in the iron-poor soils of the West, according to Woodbury.

A 40-lb. bag of new, pelletized Envy covers up to 8000 square feet, says Woodbury, which is offering a money back guarantee if satisfaction is not attained.

Texas A&M Combats St. Augustine Decline

Developing resistant strains of St. Augustine grass may be the only way to fight St. Augustine Decline (SAD), a virus devastating Texas lawns, according to Texas A&M University assistant Extension plant pathologist Norman L. McCoy.

Because the disease is parasitic on living plant cells, McCoy explained, it cannot be eliminated by present viricidal chemicals without damage to the plant. With no cure in existence, the disease can have a shattering impact economically on South Texas' homeowners, as 96 percent of Gulf Coast lawns are St. Augustine grass, McCoy said. In the Corpus Christi area alone, SAD may cause an estimated loss of \$18

million, he revealed.

Texas A&M researchers are now screening St. Augustine varieties for a source that has genetic re-spring, McCoy reported. When resistant possibilities are found, plants and progeny will be inoculated with the disease. From these, sources of resistance will again be screened for combination with an improved St. Augustine variety for market.

Grass Is Sound Absorbent Illinois Study Indicates

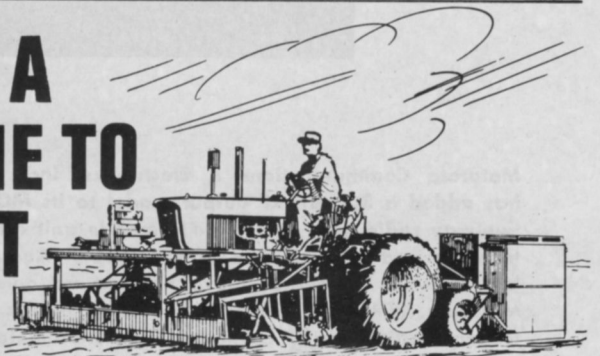
Want a quieter neighborhood? Then plant more grass, say researchers at the Riverbank Acoustical Laboratories in Geneva, Ill. Their recent studies have indicated that grass is a highly efficient sound absorber, although not an effective sound barrier, according to William Siekman, manager of Riverbank.

"Our study indicates that grass would be useful as a sound-absorbing material in closed areas, such as courtyards," Siekman explains. Looking to the future, he notes the possibility of contouring the opposing faces of buildings to direct reflected sounds into grassy areas rather than toward other buildings.

Square blocks of Marion Bluegrass, trimmed to a height of 2 inches, were used in the Riverbank tests. The sod, which was saturated with water to remove any acoustical effect due to the earth, was found to be more sound absorbent than most carpets, Siekman reports.

Riverbank Acoustical Laboratories is managed by ITT Research Institute of Chicago, an affiliate of Illinois Institute of Technology.

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Features of Baker Equipment Mfg. Co.'s (Richmond, Va.) fully hydraulic B-12 Spiratic Crane include: 6-ton capacity, 22½-foot reach, 32-foot sheave height, full 365° rotation, mounting on standard truck chassis and dual hydraulic system (one for crane, one for 15,000-lb. winch). Two self-locking A-frame outriggers extend and retract at 45° angles, offering spread of more than 12 feet, pin to pin, Baker reports. Side rollers and full-width support roller guide telescopic boom. "Wrap-around" gear teeth are securely meshed for even load distribution, says Baker. For added safety all cylinders have pilot-operated check valves. Rotational system features automatic side-pull relief to protect booms from lateral overloading. For more details circle (701) on reply card.

Motorola Communications & Electronics, Inc., Chicago, has added a 30-watt RF output model to its MOCOM-30 two-way radio line. The new FM mobile unit offers fully transistorized receiver and power supply. Audio output lets message be heard above background noises, says Motorola. PERMAKAY filter is sealed in plastic for protection against drift, aging and environmental conditions, Motorola reports. For more details circle (702) on reply card.

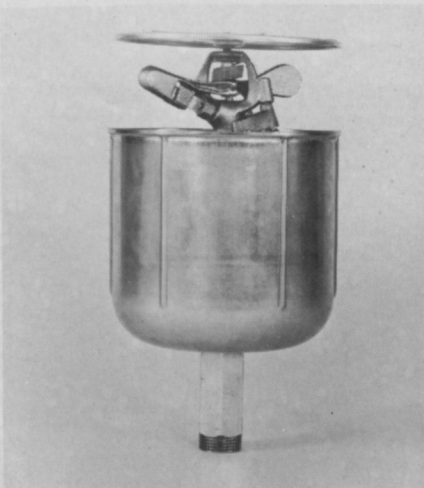


J. I. Case Co., Racine, Wis., offers its new Model 200 series "Performance King" compact tractors available in 10 hp (Model 220, shown at left) or 12 hp. Unit's sloping engine hood provides greater operator visibility, Case reports. Series 200 has matching Case-built rotary mower that cuts a 44" path. Case's compacts feature dual hydraulic no-shift drive system with "high" range (for light loads and over-the-road travel) and "low" for heavy loads. Full speed can be maintained in both high and low range, says Case. For more details circle (703) on reply card.



Vandermolen Co., North Caldwell, N. J. is marketing its new Diadem spreader and Seeder Model K-600 featuring a 1500-lb.-capacity conical steel hopper. Centrifugal spinner spreads seed or fertilizer in a 3 to 50-foot swath. Coverage can be regulated from

4 to 2500 lbs. per acre; spreader can cover 40 acres per hour with a tractor speed of 10 mph, says Vandermolen. Control full rear or one-sided spreading from tractor while driving. For more details circle (704) on reply card.



Its new all-brass Pop-Up Impulse Sprinkler defies breakdown and the need for replacement, says Turf Irrigation Corp., Commack, N.Y. Spray diameters can be regulated, plunger assembly can be

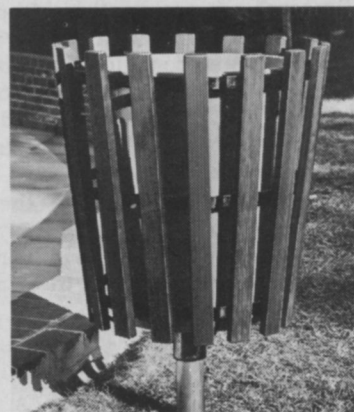
taken out without need to remove housing from ground, Turf contends. Unit requires only shallow trenching because of its small size. For more details circle (705) on reply card.



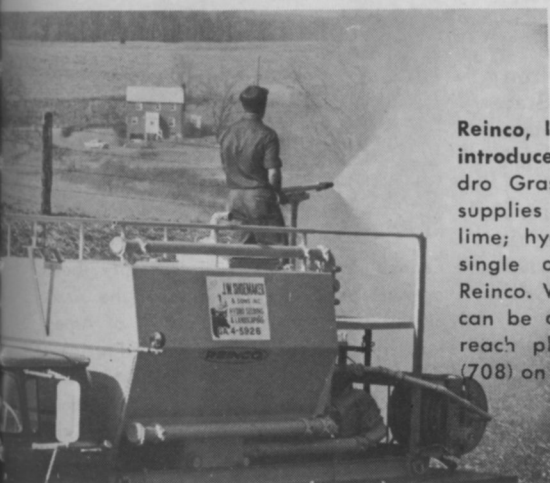
Universal Metal Products Div., Leigh Products, Inc., Saranac, Mich., has a new 3½-gal., stainless steel sprayer with 36" hose, extension tube that swivels 360°, adjustable nozzle and carrying strap. For more details circle (707) on reply card.



Gravely Corp., Clemmons, N. C., now offers a riding-walking Convertible tractor in 7.6, 10 or 12 horsepower. Features include all-gear drive, instant forward and reverse, rear engine for traction and short turning radius. Variety of attachments is available: pictured above is Gravely's new 12 hp Convertible with 50" front-mounted mower. For more details circle (706) on reply card.



Victor Stanley, Inc.'s (Dunkirk, Md.) "Litter King" receptacle takes care of trash beautifully. Walnut-stained cypress wood slats and reinforced steel rings and struts withstand even extreme weather conditions, says Victor Stanley. Unit is dip-coated to prevent rust and rot and to maintain finish. Comes with 22-gal. plastic container. For more details circle (709) on reply card.



Reinco, Inc., Plainfield, N. J., recently introduced a power reel for their Hydro Grassing Model HSJ-10WX. Reel supplies slurry of seed, fertilizer and lime; hydraulic agitation method lets single operator control spray, says Reinco. With the reel, 200 feet of hose can be attached for spraying hard-to-reach places. For more details circle (708) on reply card.



Dr. Boysie Day, left, director of the Citrus Research Center and Agricultural Experiment Station at the University of California, Riverside, and university chancellor Dr. Ivan Hinderaker welcome Dr. George R. Ferguson, right, president of Geigy Agricultural Chemicals at the international symposium on triazine herbicides held in Riverside last February. The three-day event was attended by 160 scientists from the United States, Canada, England, France and Switzerland.

Students, Public To Enjoy Louisiana Tech's Arboretum

Louisiana Polytechnic Institute at Ruston has a 30-acre Arboretum where more than 5000 trees of 300 species are being tested for general adaptability to northern Louisiana soils and climate.

Invaluable for research purposes and student instruction and experimentation, the Arboretum also serves as a recreational retreat and a means of learning about native exotic species for the public and collegians alike.

Research on propagation of ornamentals and commercial trees and plants is being done in greenhouse near the Arboretum. Greenhouse seedlings are then transplanted to the Arboretum, where their progress is evaluated year by year.

Tree species from each of the 50 states are reportedly growing in the Arboretum, whose flowering trees and shrubs are expected to attract a number of tourists each year.

Morishita Says Control Of Chinch Bug Is a Cinch

The southern chinch bug, first detected in Southern California less than two years ago, can be easily controlled, according to Frank S. Morishita, entomology technician at the University of California at Riverside.

A single application of Akton, Ethion, Diazinon or Dursban pro-

vides adequate control for 2 or 3 months, Morishita reports. The insecticides act against the pest's nymph stage, which is especially active in April in the Southland, according to the researcher.

Although a one-shot treatment offers effective control, to be on the safe side apply insecticide once in April and again in August, Morishita recommends.

Grass damaged by chinch bug nymphs, which can't be seen, turns an off-color green, he reports. Good cultural practices, along with an insecticide, help control the pest, which hits where grass is weakest.

Jersey Clean-Up Program Stresses Weed Control

Urban beautification programs being encouraged in New Jersey stress the control of noxious weeds as well as the elimination of litter.

Weed-free lots, says Archie B. Freeman of the Division of Environmental Health, New Jersey State Department of Health, are not usually subjected to dumping and littering as are weedy vacant lots.

Interest in noxious weed control programs was on the upswing in 1968, Freeman reports, with an increasing number of municipal health departments asking for state financial aid for such programs this year.

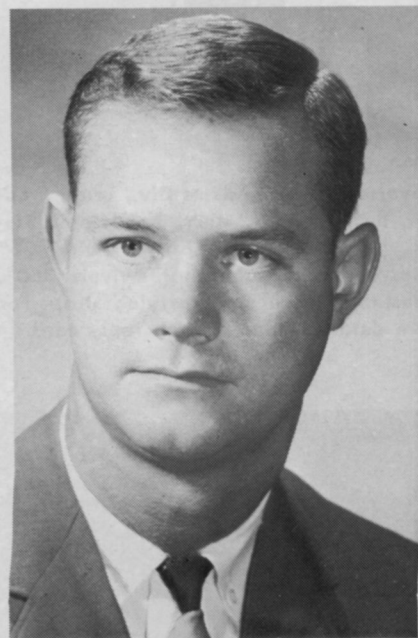
To encourage and recognize effective local weed control programs, Jersey's Division of Environmental Health has established a special citation and awards program.

Preventing Law Suits Involving Employees' Cars

If one of your employees, while on a company errand and driving his own car, is involved in an accident, the company can be liable, cautions an article in the *Indiana Nursery News*, publication of the Indiana Association of Nurserymen, Inc.

Insurance company studies indicate that even the occasional use by a company of an employee's car—even if the person is merely to mail a letter on his way home from work—is sufficient to establish a business relationship, with the company, consequently, considered liable in case of an accident, the article reveals.

To safeguard against such law suits, a company has three alternatives: (1) never allow an employee to use his own car for company business; (2) have your insurance company include a non-ownership contingent liability coverage in your company policy; or (3) contact the insurance firms of all employees, requesting copies of "Evidence of Insurance Certificates," which are usually easy to obtain and give a complete picture of the employee's car insurance coverage, the article says.



Clarke W. Davis has recently been named Executive Director of the Associated Landscape Contractors of America, Inc., according to ALCA President Tom Lied. Davis is also Executive Secretary of the National Arborist Association and Executive Director of the American Society of Consulting Arborists.

Insect Report

WTT's compilation of insect problems occurring in turf-grasses, trees, and ornamentals throughout the country.

TURF INSECTS

AN APHID

(*Phopalosiphum padi*)

CALIFORNIA: Heavy on grass and iris plants in Encanto, San Diego County.

GREEN JUNE BEETLE

(*Cotinis nitida*)

ALABAMA: This species and *Phyllophaga* spp. (white grubs) ranged 20-25 per square foot in Coastal Bermuda-grass in Cullman County.

A MAY BEETLE

(*Phyllophaga tristis*)

FLORIDA: First emergence of year noted in Gainesville area, Alachua County.

CHINCH BUG

(*Blissus leucopterus*)

KANSAS: Bunch grass samples collected in late February from 55 central and eastern counties. Total of 173 samples collected. Average number per square foot by district as follows: Northeast 0.89 (only in Riley County); east-central 14.0; southeast 17.3; north-central 0; central 67; south-central 95.6. Highest average counts above 100 per square foot by county; Morris 114 (range 0-4); Dickinson 222 (range 0-5); Marion 212 (range 0-5); Harvey 137 (range 0-150); Sedgwick 107 (range 0-21).

INSECTS OF ORNAMENTALS

A CHRYSAUGID MOTH

(*Galasa nigrinodis*)

VIRGINIA: Larvae on English boxwood light in Hanover County, medium in Charles City County, and light in Charlotte County.

A WALSHIID MOTH

(*Periploca nigra*)

CALIFORNIA: Heavy in juniper shrubs in Placerville, El Dorado County.

MINING SCALE

(*Howardia biclavis*)

FLORIDA: All stages severe on stems of undetermined number of 200 dombeya hybrids, *Dombeya* sp., at Miami, Dade County. This is a new Florida Department of Plant Industry host record.

TEA SCALE

(*Fiorinia theae*)

ALABAMA: Heavy increase of crawlers noted on camellia and holly. Averaged 25-75 per leaf on heavily infested plants. Many growers applying controls.

TREE INSECTS

ELM LEAF BEETLE

(*Pyrrhalta luteola*)

MICHIGAN: Taken in Wayne County.

SPRING CANKERWORM

(*Paleacrita vernata*)

MICHIGAN: Adults active in Muskegon and Ingham Counties.

FOREST TENT CATERPILLAR

(*Malacosoma disstria*)

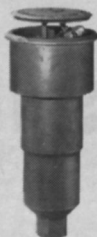
COLORADO: Egg survey indicates populations will be same as in 1968 in Fort Collins area, Larimer County.

A SOFT SCALE

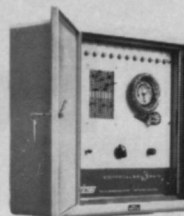
(*Toumeyella pinicola*)

CALIFORNIA: This species and *Phenacaspis pinifoliae* (pine needle scale) medium on Monterey pine in Oakland, Alameda County.

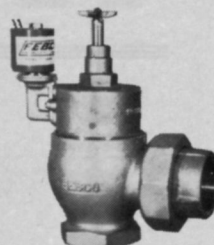
WEEDS TREES AND TURF, May, 1969



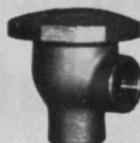
98 Sprinklers
1/2" - 1-1/2"



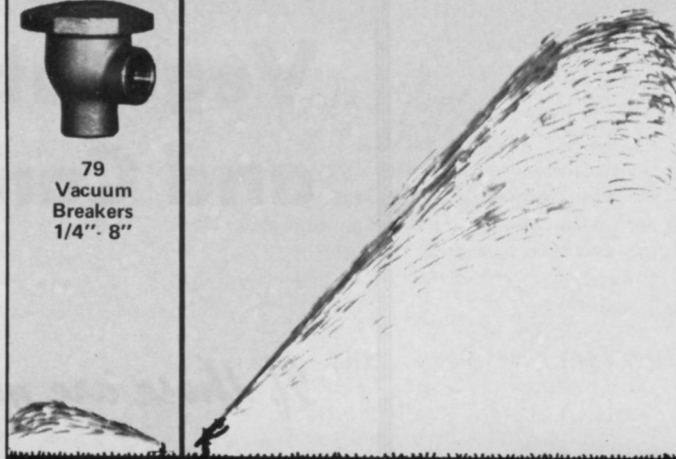
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Rates: "Position Wanted" 10¢ per word, minimum \$3.00. All other classifications 20¢ per word, minimum \$4.00. All classified ads must be received by Publisher the 10th of the month preceding publication date and be accompanied by cash or money order covering full payment. Bold-face rule box: \$25.00 per column inch, two inch minimum.

HELP WANTED

WANTED: Working foreman with knowledge of plant materials, intelligent, energetic; "new blood" for old established firm. Must be capable of running landscape jobs and co-ordinating maintenance. Fringe benefits. State experience, qualifications and salary required. Box 40, Weeds Trees and Turf, 9800 Detroit Ave., Cleveland, Ohio 44102.

EXCELLENT opportunity for recent two-year graduate in ornamental horticulture to assist in directing staff of 40 men engaged in construction and maintenance relating to general horticulture, golf course, greenhouses, woodlands, etc. Call or write, Greenrock Corporation, Poynter Hills, Tarrytown, New York 10591. Phone 914 631-4560.

Remington Arms Expands Service Center Network

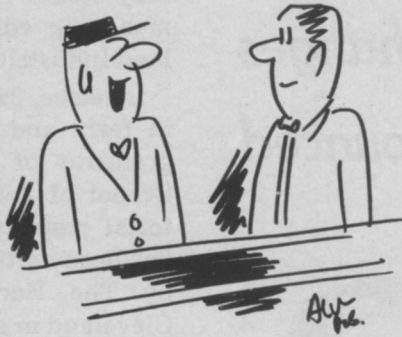
Remington Arms Company, Inc., Park Forest, Ill., is currently organizing a nation-wide network of Authorized Service Centers designed to improve maintenance on its complete line of chain saws.

Under the new system, centers selected for the program will be in direct contact with Remington's Park Forest headquarters by means of toll-free phone lines for rapid parts ordering or technical advice. A special feature of the service program is same-day prepaid parts shipment, according to the firm.

Herbicide Selector Chart

A new bulletin on industrial grass, weed and brush control has been published by Chapman Chemical Company of Memphis, Tenn. The four-page "Herbicide Selector Chart" simplifies the choice of herbicide for any type of vegetation control problem. For the 11 products listed, the following information is given: Chemical content and form (granular, pellet, liquid, etc.), type of control, when to use, rate of use, package size, equipment required, and results to be expected. Copies are available free by writing Chapman Chemical Company, P.O. Box 9158, Memphis, Tenn. 38109. Request Form Number 5001.

AL'S
WEED
CONTROL



"Well, everybody's paid up through 1960."

Ferguson Fumigants Offers New Gelled Soil Fumigants

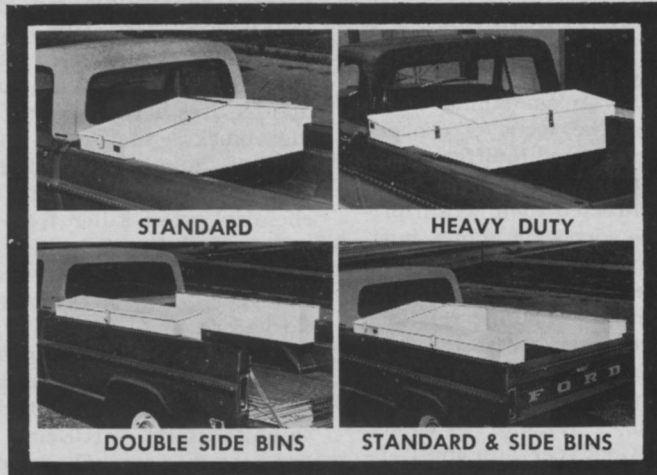
Dean Roy, Marketing Manager of Ferguson Fumigants, Inc., recently announced U. S. Department of Agriculture approval of Ferguson's two new gelled methyl bromide soil

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fumigants: ROTOX and ZYTOX.

Both formulations are effective without the use of the plastic sheet cover usually required for methyl bromide soil fumigation, Roy reported. Use of the formulations in jelly form makes it possible to retard, control and regulate volatility, he said. For specimen label copies or literature, circle (710) on the reader service card in the front of the magazine.

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Magazine Staff Changes Announced



Art Edwards

Gene Ingalsbe

A new editor for WEEDS TREES and TURF magazine began his duties with this May issue. He is Gene Ingalsbe, formerly managing editor of publications for Farmland Industries of Kansas City, Mo.

Ingalsbe, 39, has some 15 years' experience in farm and newspaper reporting. He is a graduate of the University of Missouri's School of Journalism. He assumes the editorial responsibilities of Art Edwards, who has been editing WTT since it was purchased by The Harvest Publishing Company of Cleveland in early 1967.

Edwards remains as Editorial Director and will devote more time and effort to market research and participation in the industry on both WTT and its companion magazine, PEST CONTROL.

Since WTT has become the property of The Harvest Publishing Company, circulation has been built from 10,000 to 33,000 on a controlled basis to serve the entire vegetation care and control phases of the non-crop horticultural industry.

Trimmings

CAMPUS ANTI-BUSINESS attitudes have become serious enough that three top industry leaders are attempting to do something about the problem. The focus of concern is business' presumed indifference to current social problems. While students have directed their wrath primarily at the corporate giants, businesses of all sizes and nature would do well to take note of the problem and to review their public relations efforts in the communities in which they operate. The industry leaders, H. D. Doan, president of Dow Chemical Company, Russell DeYoung, chairman of Goodyear Tire and Rubber Company, and Robert W. Galvin, chairman of Motorola, have established a dialogue with students through 48 campus dailies across the country. The executives are personally answering student charges in an attempt to bridge the apparent communications and credibility gaps with students.

* * *

PRESERVATION OF HISTORY isn't something you quickly think of as being a contribution of weed

killers. Nevertheless, a good example came to light recently. Those persons responsible for caring for the Roman Colosseum have noted that weeds had begun to inflict damage. Growing between the bricks and fissures between stone and marble blocks, the roots of weeds reached quite deep and expanded, causing some stones to split. A chemical weed killer from the U.S.—tested to be sure it would not stain the stones—was brought in this year to rescue the picture post-card arena.

Another enemy seems to be the motor car. Traffic vibrations are thought to have an effect on the amphitheater's artificial foundations set in water. Growing concern over slowing the deterioration of the Colosseum may hail back to the seventh-century philosopher who warned:

"While the Colosseum stands, Rome will stand. When the Colosseum falls, Rome also will fall. But when Rome falls, the world will also fall."

* * *

WHICH TO USE? liquid or dry fertilizer? Forget about the difference in effectiveness, advises Dr.

C. B. McCants, soil scientist at North Carolina State University. "My advice is to compare the two types of fertilizer on the basis of guarantee of the form and content of nutrients, cost, and convenience."

* * *

THE LASER, that amazing high-intensity light beam, may one day help you kill weeds. It has been fighting, with promising results, the toughies of the weed legions—those that clog ponds, waterways and ditches, such as alligator weed, water-hyacinth and watermilfoil. The U.S. Corps of Army Engineers is testing the laser to control water weeds at the Army Missile Command's Redstone Arsenal at Huntsville, Ala. The laser "not only destroys floating plants, but also kills those that are submerged by upsetting the enzyme systems inside the plants," says R. A. Scott, Jr., office of the Chief of Engineers. Yet the laser produces no harmful effects to fish, wildlife or water quality, says Scott. It is not dangerous to use, "although you could get a sunburn from it," he adds. The beam may be projected by equipment mounted on a boat or helicopter, he says.



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