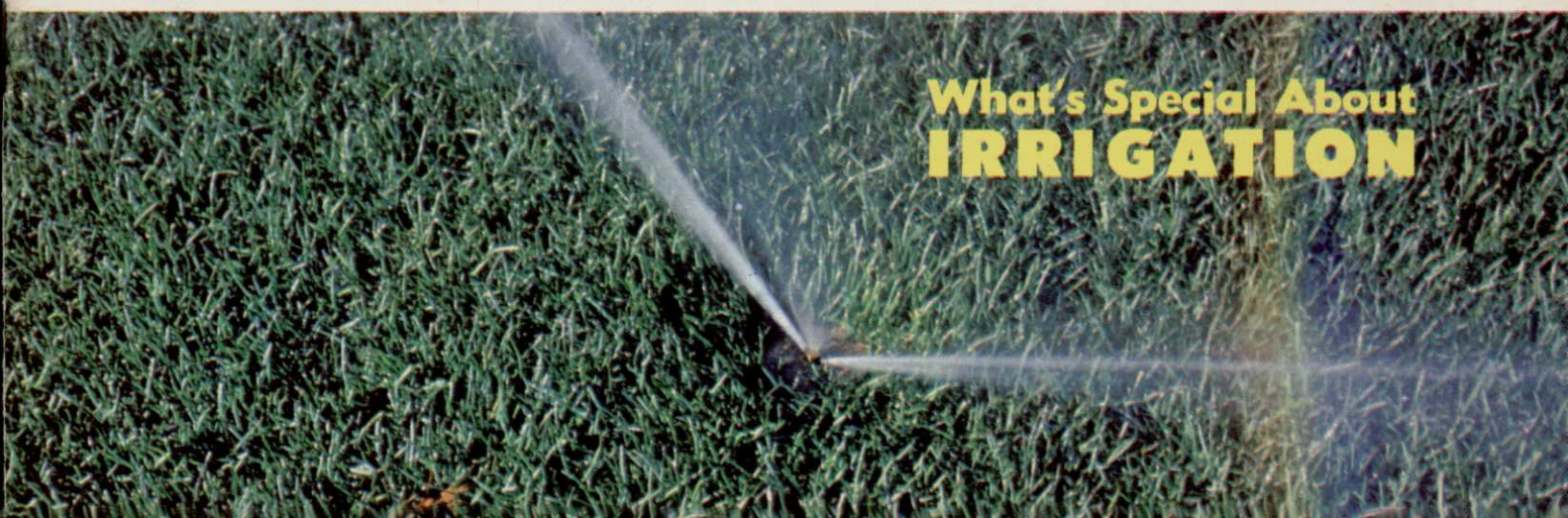




MARCH, 1970

WEEDS TREES and TURF



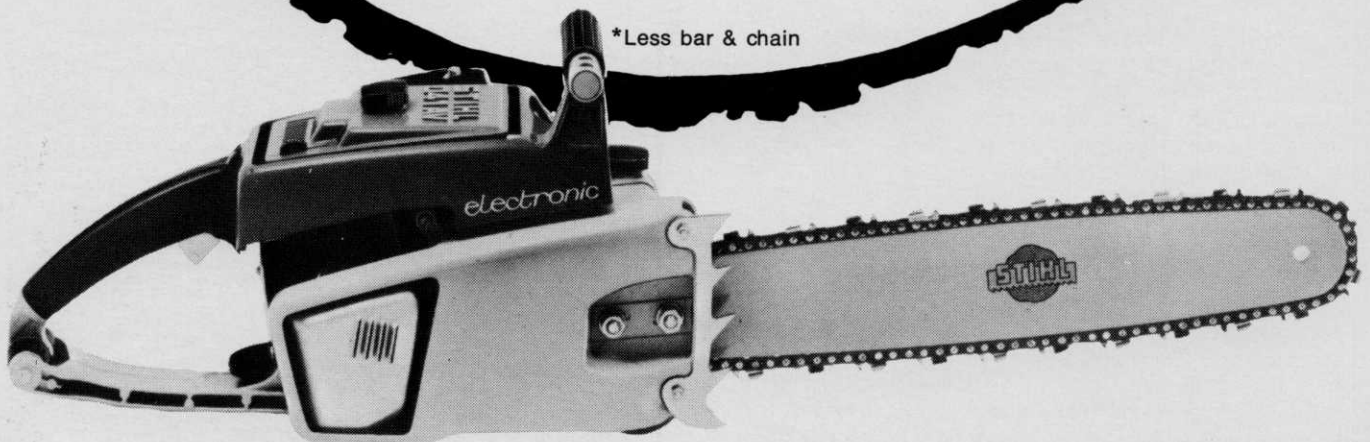
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In keeping with our policy of offering the most advanced and most dependable in chain saws — we have incorporated solid state ignition into the STIHL 041 AV Electronic Saw. Other than eliminating the need for points and providing a molded circuit that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

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**This man
just cut
and rolled
over 10,000
yards of sod
and didn't even get
his hands dirty.**

Dirty hands and aching backs are obsolete with the Ryan Sulky Roller. This rugged unit attaches to a Ryan Heavy Duty Sod Cutter, enabling *one man* to cut and roll up to 15,000 yards of perfect sod per day.

The Sulky Roller operator rides while cutting sod to any length. At the same time it rolls sod up to 24" wide and gently pushes each roll from the cutting path.

If you own a Ryan Heavy Duty Sod Cutter, all you do is order the Sulky Roller with a conversion kit. It attaches quickly and easily with six bolts into existing holes. In minutes you've got a "sod harvester", ready to cut your labor costs and cut big payloads of quality sod.

If you're in the market for a Ryan HD Sod Cutter and want the Sulky Roller, it comes as a complete unit from the factory. The HD Sod Cutters will be equipped with a powerful 12 HP Briggs & Stratton engine.

For information about the Sulky Roller and other fine Ryan sod farm products, write for the NEW Turf Equipment Catalog.



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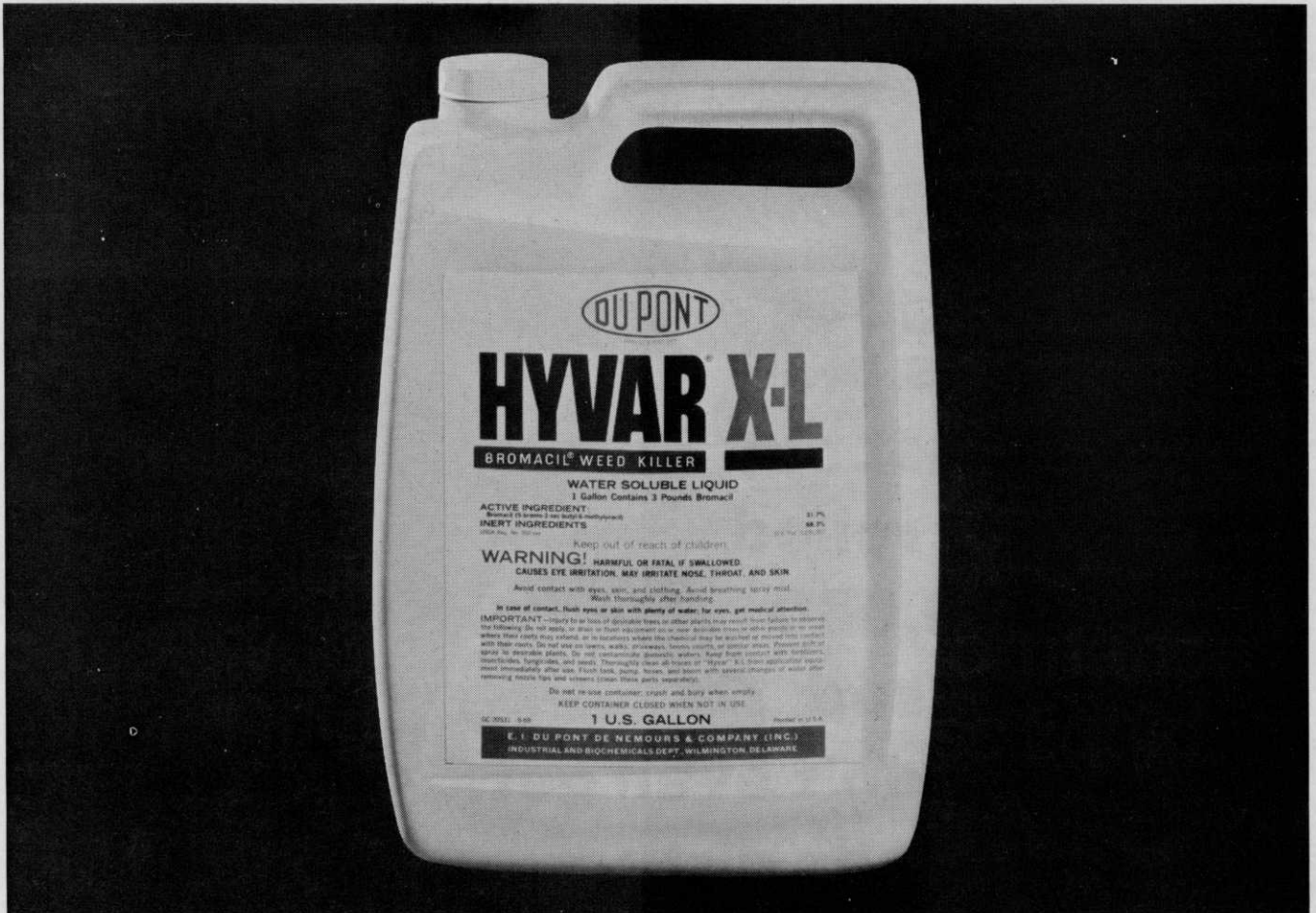
RYAN SULKY ROLLER ATTACHMENT

Converts the Ryan HD Sod Cutter into a one-man "sod harvester". It's available with conversion kit for your present Ryan cutter or can be purchased with a new one. It'll quickly pay for itself!

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This new liquid can be purchased in 1, 5 or 30 gallon containers. All you do is add water and spray. No special

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City _____
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Better things for better living...through chemistry

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Sprinkler Irrigation Association's specifications subcommittee has compiled a 41-point check list to help you obtain proper irrigation installations.
- Irrigation by Computer** 18
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- Eight Good Ideas for Golf Course Irrigation** 20
Austin Miller, Miller Sprinkling Systems, offers tips for trouble-free operation of irrigation systems.
- Large-Area Irrigation** 22
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- Beauty, Upkeep, Status Push Commercial Turf Irrigation** 26
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- Where There's Smoke, There's Fire of Protest** 32
California report indicates wood and grass burning is highly criticized, though photochemical pollution is relatively low. Tips are given on how to burn with least offense to the public and least contribution to air pollution.

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The Cover

A turf irrigation system is a pleasing sight, on or off. It's pleasing when it's off because of the green "residue" it leaves — healthy green grass. It's pretty when it's working, particularly when the spray creates a rainbow. The system on the cover is on the grounds of Turf Irrigation Corporation, Commack, N.Y. The rotary popups cover an acre. A. Brown, vice-president, sales, talks about the mushrooming demand for turf irrigation on commercial grounds. His article is on page 26.



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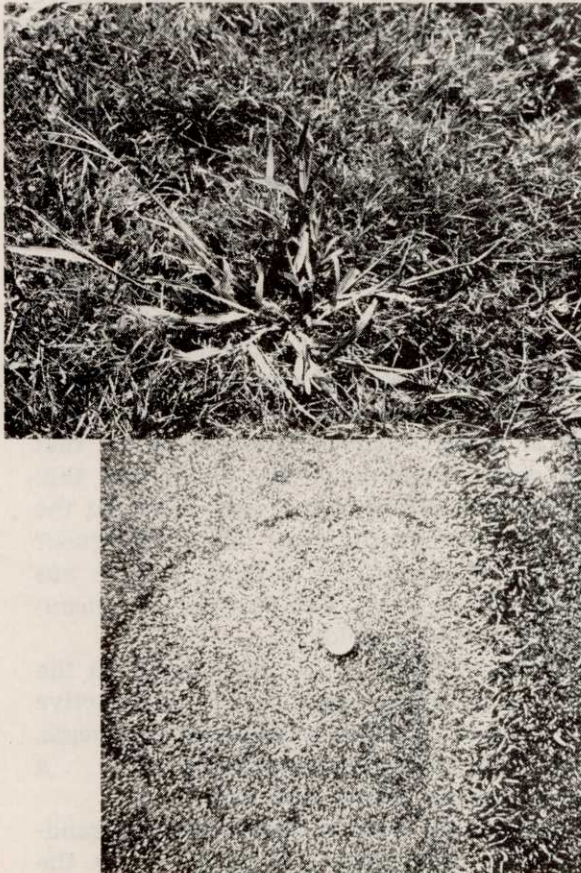
3. Daconil 2787, the ONE fungicide, controls a broad spectrum of turf disease organisms. Try these three great ways to take trouble out of turf.



out of turf.

Dacthal[®] 1.

is the premium preemerge herbicide proven most effective through field testing and years of use. Controls crabgrass, *Poa annua*, and 14 other undesirable weeds and grasses. One application lasts all season. For *Poa annua* control follow label directions.



Dacamine[®] 2.

herbicide controls broadleaf weeds such as dandelion and plantain without hurting your grass. Kills deep—down to the root tips—for complete weed eradication. But only where you spray it—non-volatile Dacamine won't vaporize to injure desirable plants.

3.

Daconil 2787[®]

—the ONE fungicide—handles a *broad spectrum* of disease organisms not just one or two. And it does it right through the time you need it most. Turf grasses have exceptional tolerance to Daconil 2787, even in hot, wet weather. So you can maintain lush, deeper green turf all season.

If you're looking for a way to have healthier, more beautiful turf, ask for our folder AG-207. From Agricultural Chemicals Division, Diamond Shamrock Corporation, Dept. H 2170, 300 Union Commerce Bldg., Cleveland, Ohio 44115.



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Chemicals**

THE system of weed and disease control.

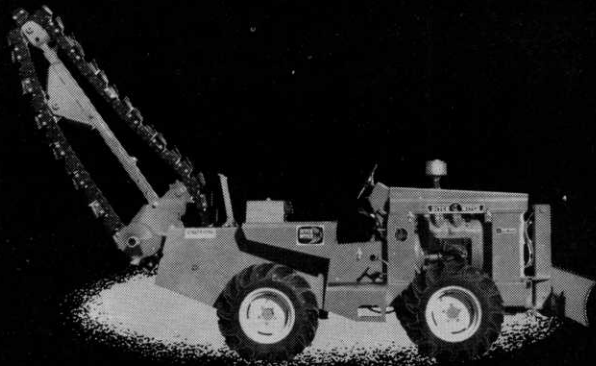
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FROM 7-HP TO 60-HP ...
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V30 the 30-HP unit from Ditch Witch can dig up to 1,200 FPH at depths up to 6', widths to 12". It features four-wheel-drive, four mechanically-selective digging chain speeds, plus reverse, and full hydraulic control. While trenching, travel speed is controlled hydraulically, allowing full mechanical power to be used independently for selective digging chain speeds. Positive hydraulic power steering allows V30 to trench straight or on a curve. Attachments are available, including backhoe, vibratory plow and boring units.



R60 the most powerful Ditch Witch with 60-HP performance and full hydraulic control convenience. The R60 can trench up to 2,000 FPH, at ranges up to 7' deep, 2' wide. It features four-wheel-drive, four mechanically-selective digging chain speeds, plus reverse. While trenching, travel speed is controlled hydraulically, allowing full mechanical power to be used independently for selective digging chain speeds. The R60 does it all — trenching or backfilling, it has no match! A full line of attachments is available, including backhoe, vibratory plow and boring units.

DITCH WITCH

CHARLES MACHINE WORKS, INC. • 100 ASH ST. • PERRY, OKLA. 73077

EDITORIAL

Pesticides or Suicide? Perhaps, the Way We Talk

Two efforts to give a positive swing to the pendulum of public opinion about chemicals are worth reporting.

If anything needs to be banned right now, says Dr. E. P. Sylvester of Iowa State University, it's "pesticides" — the word, that is. The term has acquired an undeserved shady reputation, as have a number of other good English words, for one reason or another.

It is time, he believes, to "accentuate the positive and eliminate the negative," to borrow a phrase from a song popular during World War II.

How does Dr. Sylvester speak of ridding farm fields of weeds and insects? He advises using "Crop Protection" chemicals.

Now why didn't we think of that approach before?

Environmental purification is the national hang-up at the moment. Yet the makers and users of chemicals have thought that's what they were trying to do all along — preserve and improve that which is desired and beneficial; eliminate that which is noxious or unwanted. How then did the chemical image get on the dirty side of the fence?

Publicity of damage from chemical misuse was a big factor, to be sure. But perhaps an unconscious factor was terminology.

Classification names of chemicals focus on the negative means rather than on the constructive end results. To wit: herbicide, pesticide, fungicide, insecticide, rodenticide, and endlessly on . . . a language syndrome of kill, kill, kill.

The industry has done a better job of brand-naming specific compounds. For the most part, the names have tended to be brief to aid recall, yet they carry a hint of something scientific. Is there room for improvement?

One chemical compound comes to mind that seems to be named perfectly for the times. It's benfen. Note that the word connotation is good.

Perhaps it would be worth thinking public relations twice as environmental chemicals are named and talked about.

A second effort to publicize the contributions of chemicals is contained in a non-commercial film put together by the Du Pont Company. It tells the weed control story on Washington state highways.

It's an excellent film. Scenes show how beauty is achieved, how safety is increased through reduced driving hazards from fire and smoke, how crews are trained and operate, how maintenance costs are reduced.

The film is keyed to the interests of civic groups, conservationists, agricultural students, or really most anyone.

Copies will be made available on an extended loan basis to weed specialists, agriculture instructors, highway maintenance engineers, and film libraries. Requests should be addressed to Public Relations Department, d-5082, Du Pont Company, Wilmington, Del. 19898.

More films like this one are needed — with one added ingredient: drama, to arouse emotion favorable to chemicals. Scenes are needed to counter the shock of seeing hundreds of dead fish, or the grotesque forms of dead birds, or the "terrifying cloud of death" spewing from a spray plane.

What the public needs to see is a malaria-stricken child, a pest-riddled crop field, the tragedy of a refinery or warehouse fire that started in dry weeds, the agony of an automobile accident caused by an obstructed crossroad, some of the innumerable crises that could develop with a power failure caused by trees breaking power lines, the disaster of a train wreck from a weed-infested and weakened roadbed or a burned-out trestle. Then there are always the rats.

Overly dramatic? Perhaps. But this is the very technique a Montreal television station, CTV, used recently to substantiate its show title, "Pesticides or Suicide." Facts were exaggerated, some claims completely false, projections absurd, but the emotional impact contrived against pesticides was superb.

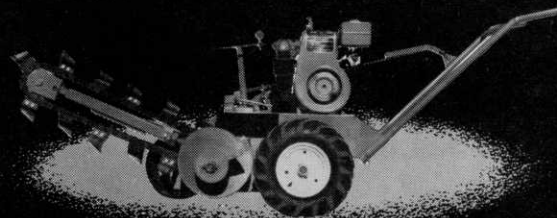
Ironically, the film was shown the second night of a gathering in that city of the best minds of two countries on the subjects of pesticides and herbicides — some 600 members of the Weed Science Society of America. Though the meeting site had been selected two years in advance, the television station somehow missed the opportunity to find out the real story about pesticides. It didn't even send a reporter to cover the meeting.

What's worse, perhaps, is that this editor asked at least a dozen WSSA members if they had seen the TV report. Only one had . . . and that may indicate another problem in itself.

Gene Ingalsbe

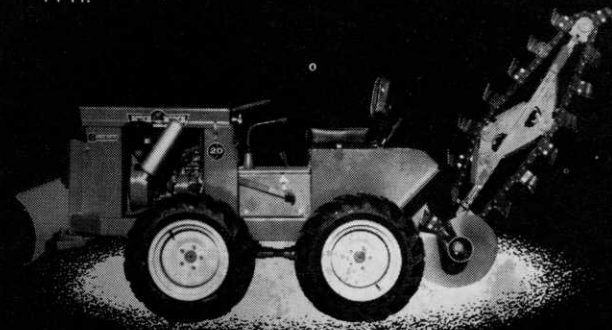
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FROM 7-HP TO 60-HP . . .
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HANDLEBAR SERIES

Easily maneuvered, ideal for working in close quarters. The C-Series is available with 7-HP or 9-HP engines and can dig up to 2' deep, 6" wide. So compact it can be driven through a standard yard gate. The M-Series comes with 9-HP or 12½-HP engines with a digging range up to 5' deep, 12" wide and offers three digging speeds, plus reverse. Both the C and M are completely self-propelled. Patented planetary gear-reduction unit gives mobile speed range up to 3 MPH for moving around job, digging capabilities up to 400 FPH.



J20 is an 18-HP, four-wheel-drive unit which can dig up to 900 FPH in ranges up to 5' deep, 12" wide. It offers three mechanically-selected digging chain speeds, plus reverse, and has hydraulically-controlled boom, backfill blade, steering and travel speed control. While trenching, travel speed is controlled hydraulically, allowing full mechanical power to be used independently for selective digging chain speeds. Designed to operate at full engine RPM providing full power efficiency for trenching. Can be equipped with boring attachment.

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2 men can plug or sprig three acres of grass a day with the revolutionary **BECK LAWN-O-MATIC**



Two men can plug or sprig three acres a day of Zoysia, Bermuda, Centipede, or St. Augustine grass. The self-propelled Lawn-O-Matic automatically digs three furrows, cuts 1½" x 2" plugs from 1' x 2' sod blocks, inserts them in the furrow, and then closes the soil around the planted grass with the heavy duty roller.

The three-row Lawn-O-Matic places the grass plugs or springs 8" apart in rows 7½" apart.

Planting grass at the rate of 300 square feet per minute, five average lawns, front and back, can be planted in one day with two men.



Your first ten days of full operation will pay for the Lawn-O-Matic; labor-saving is over 90%.

The Lawn-O-Matic creates profits for you whether you offer a lawn plugged or sprigged, or whether you rent the Lawn-O-Matic to "Do-it-yourselfers".

The versatile Lawn-O-Matic serves as a sod carrier and easily moves five square yards.

The U.S. Patented Lawn-O-Matic is available in 1, 2, or 3 row machines and is priced at only \$895.00. This machine was developed by Alabama's largest grower of sod.

Write Box 752, Auburn, Alabama for more information.

Inquiries from manufacturers representatives and distributors invited.
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Spray-paint **TRE-HOLD**[®]

after your 1970 pruning

and cut trimming

costs in 1971!

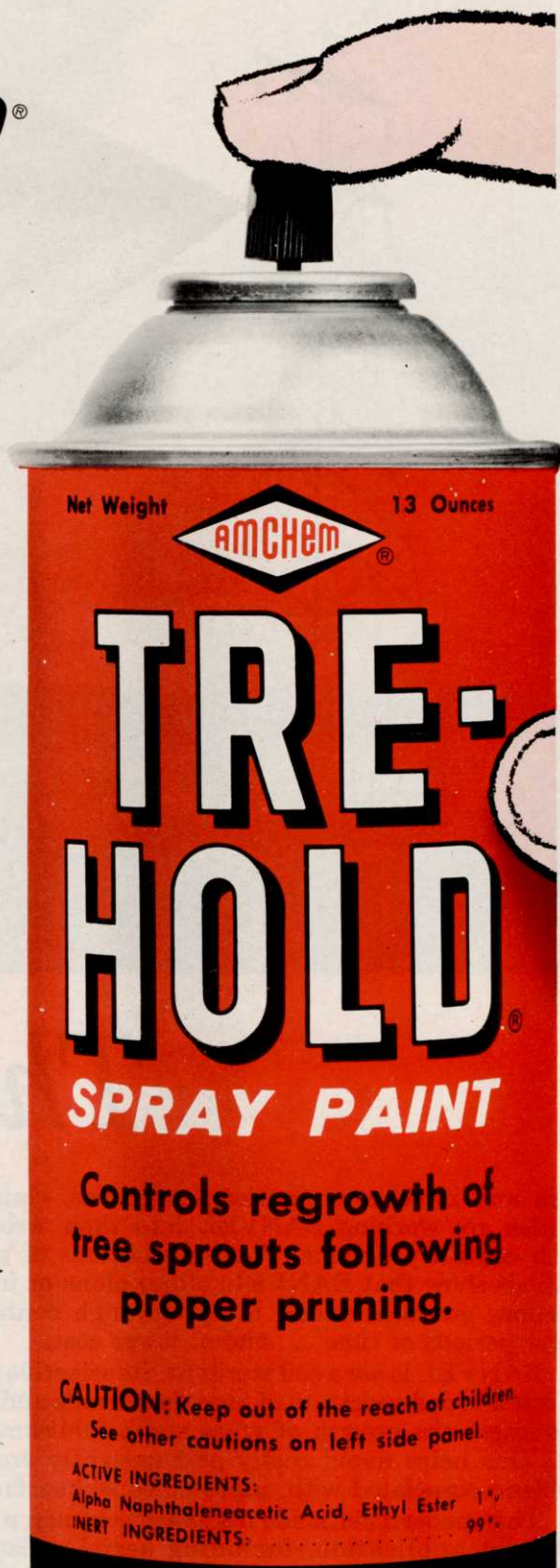
TRE-HOLD Spray Paint is really a money-saver. One utility reported that they saved \$200,000 on their annual trimming budget and another company estimated a \$60,000 savings. You simply spray it on the freshly cut wood.

TRE-HOLD is also available as a paint in gallon cans for application by brush ■ Ask your Amchem representative for further information.

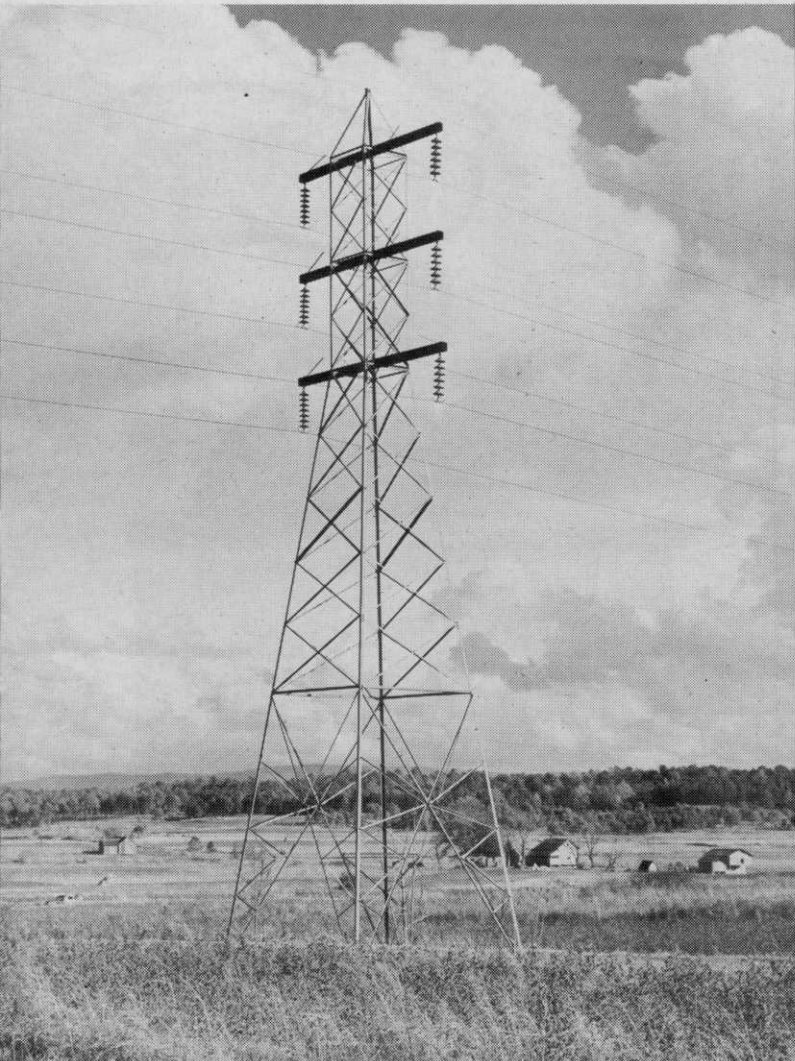
First name in herbicide research.

amchem[®]

Amchem Products, Inc.
Ambler, Pennsylvania



Is grass your heaven,



Think BANVEL[®]

More and more communities, companies, clubs and utilities are working BANVEL into their weed and brush control programs. Their evaluations of control methods show that BANVEL, either alone or in combination, produces wider, more thorough control for longer periods of time . . . and at lower cost.

BANVEL is *not* a soil sterilant. Its selective action against a broad spectrum of broadleaf weeds and brush encourages the growth of grass and establishment of sod. This helps avoid costly and unsightly erosional problems associated with unprotected soil surfaces.

This modern herbicide fits every common method of liquid application, including aerial, mist, and hydraulic. Its granular form is ideal for broadcast or

spot applications, particularly where older weed brush and weed trees have become established.

BANVEL translocates through leaves, stems and roots to kill many of the most stubborn and economically significant weed and brush pests. Under certain conditions BANVEL works beautifully with other herbicides to widen control and to lower costs.

We are ready to work with you to determine exact rates and most effective and economical methods of application *for your specific conditions*.

Write or call collect, the regional office (listed below) most convenient to you. You will receive immediate cooperation.

weeds your...hell?



Partial list of broadleaf weeds, weed brush, weed trees controlled by BANVEL, BANVEL/combinations

Ash	Mouse-ear Chickweed	Mesquite
Aspen	Oak	Cottonwood
Basswood	Persimmon	Stinging nettle
Cedar	Pine	Smartweed
Cherry	Poplar	Dog fennels
Clover	Sassafras	Corn cockle
Common chickweed	Service berry	Cow cockle
Curly dock	Sheep (red) sorrel	Knawel
Dog fennel (mayweed)	Sourwood	Fiddleneck
Elm	Sumac	Canada thistle
Hickory	Sycamore	Field bindweed
Hornbeam	Thorn apple	Pepperweed
Knotweed	Thornberry	Tansy ragwort
Locust	Willow	Purslane
	Witch hazel	Sunflower
	Yaupon	Careless weed

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Midwest Region, 341 East Ohio St., Chicago, Illinois 60611, (312) 467-5700, Ext. 235, TWX 910-221-5032, VELSICORP—Chicago • **Northeastern Region**, 341 East Ohio St., Chicago, Illinois 60611, (312) 467-5700, Ext. 323, TWX 910-221-3109, VELSICORP—Chicago • **Southern Region**, 3701 Kirby Bldg., Suite 1286, Houston, Texas 77006, (713) JA-4-2906, TWX 910-881-3709, VELSICORP—HOUSTON • **Southeastern Region**, Scott Hudgens Bldg., Suite 279, P. O. Box 20909, Atlanta, Georgia 30320, (404) 762-1457, TWX 810-751-8538, VELSICORP—ATLA. • **Western Region**, Disneyland Plaza Hotel, Suite 2, Anaheim, California 92802, (714) 635-3741, 635-3742, TWX 910-591-1180, VELSICORP—ANAHM.

Velsicol  **Banvel**

Velsicol Chemical Corporation, 341 E. Ohio St.
Chicago, Illinois 60611

Minimum Installation Specifications for Turf

EDITOR'S NOTE: This issue emphasizes irrigation. It seemed appropriate, therefore, that we publish a guide of things to watch for when installing a system. One of the best check lists we've seen has been compiled by the national Sprinkler Irrigation Association, Washington, D.C. We publish it with special permission from SIA. Note that this guide is for installation only; a design and material specification should also be prepared.

1. Scope of Work

The work under this specification includes all labor, materials, taxes, tools and equipment necessary to furnish and install a sprinkler irrigation system as specified and shown on the drawings for the named location.

2. Plans and Contract Documents

The Contract Documents shall consist of Plan # _____ Dated _____ Prepared by _____ and Specification, Pages _____ Dated _____ together with the properly executed contract.

3. Time of Completion

The Contractor shall commence work within fifteen calendar days of receipt of written notice to proceed and shall complete the work within _____ working days, weather permitting. The intended starting date of this work is _____.

4. Bonds

Labor, material and performance bonds shall be furnished to the Owner by the Contractor, when requested by the Owner. The Owner shall reimburse the Contractor for the cost of the bonds.

5. Codes and Permits

The Contractor shall apply and pay for all necessary permits and fees required in the pursuit of his work as required by the governing codes. The Owner shall furnish and install the utilities necessary according to plan, at no cost to the Contractor, unless otherwise specified. All further site connections for Contractor's use shall be made by Contractor.

6. Insurance

The Contractor shall furnish to the Owner certificates of insurance in an "admitted carrier," evidencing coverage of:

- 1) Workmen's compensation and employer's liability insurance, and
- 2) Comprehensive General Liability and Comprehensive Auto Liability Insurance, (XCU exclusion not to apply). Minimum limits of liability shall be \$100M/300M Bodily Injury Liability and \$25M—each accident—Property Damage Liability.

These minimum limits should be raised when greater exposure to loss exists.

7. Errors or Conflicts in Drawings and Specifications

The Contractor shall immediately notify the Owner's representative should he find any errors or conflicts in the drawings and/or specifications. The Owner's representative will render his interpretation or instructions on the items submitted as soon as practicable.

8. Substitution of Material

The Contractor shall use materials as specified. Materials other than that specified will be permitted only after written application by the Contractor and written approval by the Owner.

9. Protection of Utilities and Other Work

Any and all damage to utilities, or other properties, caused by the Contractor shall be immediately repaired by the Contractor, at no addition to

the contract price. The Owner shall make available to the Contractor the location of existing utilities.

10. Working Area

The Contractor shall confine his operations to the areas to be improved, and to the areas allotted to him by the Owner for his operation, and for material and equipment storage.

11. Supervision by Contractor and Owner

The Contractor shall maintain continuously a competent superintendent satisfactory to the Owner, on the work during progress, with authority to act for him in all matters pertaining to the work. The Owner shall designate a representative with authority to act for him in all matters pertaining to the work.

12. Subletting and Assignment

The Contractor shall not assign or sublet any portion of this work without written approval of the Owner of the specific sub-contractor.

13. Payments, Partial and Final

On or about the first of each calendar month, a payment equal to ninety (90) percent of the work performed during the previous calendar month will be made to the Contractor. Payment of the ten (10) percent withheld from these monthly payments will be made to the Contractor upon completion and acceptance by the Owner, of all work called for under the original contract, regardless of any addition to the contract or any extension of completion time.

14. Claims for Extra Work

No claim by the Contractor for increased compensation for alterations or additions, except when done in pursuance of a written authorization from the Owner, will be considered unless written notice of claim is made to the Owner before the commencement of such work.

15. Layout of Work

The Owner shall furnish all surveys covering property lines and easements. The Contractor shall lay out all sprinkler work and be responsible for its location.

16. Progress of Work

The work shall be carried to completion with utmost speed, since time is of the essence.

17. Overtime

Overtime work will be at the Contractor's option unless required, in writing by the Owner, in which case the overtime premium will be paid by the Owner.

18. Sod Lifting and Replacing

Where piping is to be installed in areas containing established turf, the sod shall be removed from the trench line in the necessary width and to a suitable depth. The backfill shall be brought to grade by tamping before replacing the sod. Only light tamping will be permitted on the sod. The trench area shall then be cleared of all deleterious matter. The Contractor shall be responsible for maintaining removed sod and shall furnish replacement sod if existing sod fails to survive. As soon as the replacement sod has "knitted" the Contractor's responsibility for sod maintenance will terminate.

19. Excavation

The Contractor shall do all necessary excavation for the proper installation of his work. Over-excavation shall be backfilled and hand tamped prior to installing pipe. Any pumping, shoring or bracing will be done by the Contractor. If the Owner suspects rock conditions and/or the Con-

Sprinkler Irrigation Systems

tractor and Owner shall negotiate the extra compensation to be paid the Contractor. The Contractor shall barricade and/or light the excavation to prevent undue hazard to the public.

20. Pipe Installation

In general, when a manufacturer's specification exists covering installation of its material underground, it shall be followed. This shall apply to thrust blocking, handling, storage, minimum depth of cover, cathodic protection, coating protection and testing.

Underground lines up to 2" inclusive shall have a minimum horizontal clearance of four inches of each other. All other lines shall have a minimum horizontal clearance of 12" of each other. All lines shall have a minimum horizontal clearance of 12" from the lines of other trades. This requirement does not apply to lines crossing one another at angles of 45 to 90 degrees. A minimum 1" vertical clearance shall be maintained between lines which cross between these angles. Minimum depth of cover over piping 1¼" and smaller shall be 10"; 1½" to 2" inclusive shall be 14"; and 2½" and larger shall be 18", or at a sufficient depth to accommodate valves and other equipment, whichever is greater. When pipe laying is not in progress, or at the end of each day, the pipe ends shall be closed by means of a tight plug, or cap. All work shall be performed in accordance with good practices prevailing in the piping trades.

21. Drainage

When the piping system is installed in a freezing climate, it shall be equipped with automatic ball check drains on the zone lines and manual drain valves on the main lines. These shall be installed a suitable porous material sump. Minimum pitch at the low points of the system and discharged into of piping to drains shall be 3" per 100 ft.

22. Backfill

The Contractor shall do all necessary backfilling and compaction required for complete installation of the system. Compaction shall be such that the original density of the material is obtained. Backfill material shall be free from rock, large stones or other unsuitable substances. In the spring following the year of installation, this Contractor shall repair any settlement of the trenches by bringing them to grade with topsoil and seeding. Watering and maintenance of the repaired areas shall be the Owner's responsibility. Backfilling of trenches containing plastic pipe and copper pipe shall be done when the pipe is cool to avoid excessive contraction in cold weather.

23. Sprinklers and Quick Coupling Valves

Sprinklers and quick coupling valves shall be set plumb and level with the turf at locations called for on the drawings. Heads in lawn or turf areas, where grass has not been established, shall be installed on temporary risers extending at least 3" above grade.

After the lawn or turf is established and the ground has settled, the Contractor shall, within ten (10) days of notification, lower heads to finish grade. Where heads are installed along walk, roads, etc., they shall be permanently positioned. Sprinkler piping shall be thoroughly flushed before the installation of the sprinkler heads.

Elevation of the sprinkler heads and quick coupling valves is critical and the Contractor shall exercise care and set them exactly at or slightly above grade.

24. Manual Valves

Manually operated control valves shall be installed in locations as shown on plans and shall be ac-

cessible for proper use. Valves shall be installed with enough clearance for proper maintenance. Valves shall be installed with a minimum of 4" cover from finish grade, and shall be provided with a proper valve sleeve and cover extending from grade to the body of the valve.

25. Automatic Valves

Automatic control valves shall be installed at sufficient depth to provide not less than 4" cover from the very top of the valve to finish grade. Valves shall be installed in a plumb position with enough clearance from other equipment for proper maintenance. Valves shall be provided with a valve sleeve and cover extending from grade to the body of the valves. Where an automatic valve is installed under each sprinkler head, the valve box and cover may be omitted.

26. Pipe Sleeves, Augering and Boring

Where pipes are installed under roads or walks by jacking, augering, boring or open cut, the excavated material shall be replaced around the pipe to provide original density so no settlement will result. Where possible, sleeves should be installed around the pipe line. Where control wires or tubing pass beneath planting beds, sidewalks, roads or drives, they shall be installed in their own suitable sleeve. At other locations they shall be installed in the pipe trench and protected by the pipe where possible.

27. Control Wire or Control Tube

Control lines shall be at least the minimum size recommended by the Automatic Equipment Manufacturer and shall be a product approved for underground direct burial use. The connections at joints shall be by an approved method for underground use. Allowance shall be made for thermal contraction of the control lines. Control tubing shall be flushed prior to connection to the valve and/or controller. Control wire shall have an 18" loop at the valve to facilitate servicing.

28. Automatic Controller

The automatic controller shall be mounted in a manner recommended by the manufacturer and at the location called for on the plans and approved by the Owner. The Owner will provide electrical power to the controller location in accordance with the manufacturer's specifications unless noted otherwise on the plans.

29. Pumping Plant and Pump House

Motors, pumps, piping and all mechanical work shall be installed by this Contractor for a complete and operating pumping plant. Pump house, floor and footings will be installed by this Contractor unless noted otherwise on plans.

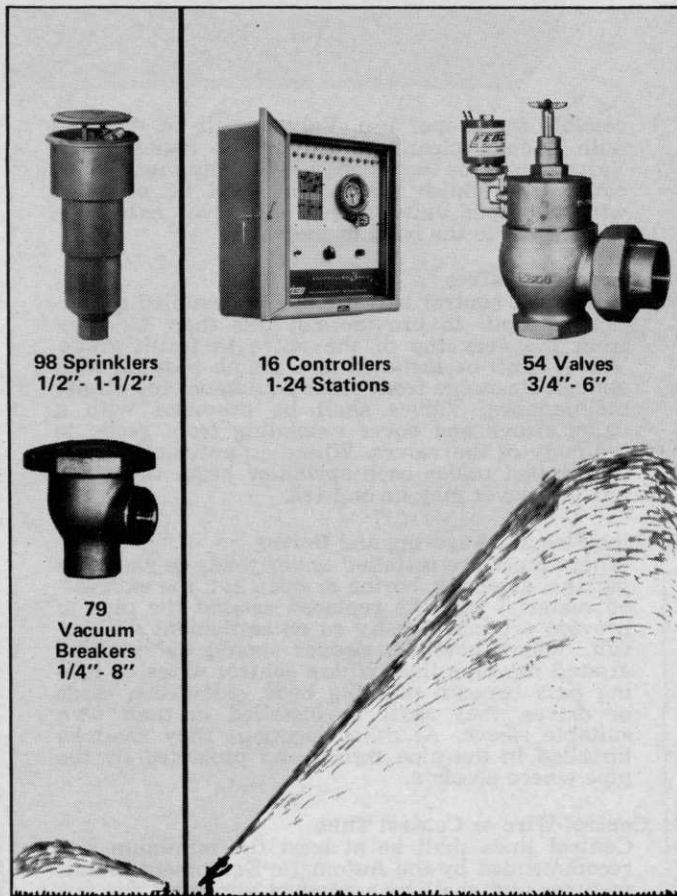
The electrical service to the pumping plant shall be provided by the Owner. All other electrical wiring and equipment shall be provided by the Contractor.

30. Backflow Prevention and Connection to Main

Where applicable, the connection to the main shall be made by this Contractor and will include a master control valve. An Approved backflow prevention assembly shall be provided and, unless the governing code specifies otherwise, shall consist of a line size check valve downstream of the master control valve.

31. Electrical Wiring and Controls

All electrical equipment and wiring shall comply with local and state codes and be installed by those skilled and licensed in the trade. Unless the governing code specifies otherwise, low voltage control wire may be installed by the Sprinkler Irrigation Contractor.



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

16 Controllers
1-24 Stations

54 Valves
3/4" - 6"

79
Vacuum
Breakers
1/4" - 8"

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32. Concrete and Asphalt Repair

Any concrete or asphalt pavement cut or damaged by the Contractor will be repaired by the Contractor. Where pipes are installed through walls below grade, the repaired wall shall be suitably waterproofed.

33. Clean Up of Area

The entire area shall be left clean and in the condition that the Contractor received the area.

34. Testing and Flushing

All main lines and lines having continuously applied pressure shall be tested at a pressure of 100 p.s.i. or at the rated pressure of the pipe, whichever is lower, and upon visual inspection of the ground, should any leak be found, it shall be repaired. The line shall then be retested until satisfactory.

Zone lines shall be tested at the operating pressure of the zone and, should any leak be found, it shall be repaired and the zone retested. After testing, the system shall be thoroughly flushed with a minimum of 150% of the operating flow passing through each pipe, beginning with the larger mains and continuing through the smaller mains in sequence. When the testing and flushing is complete, the Contractor, in the presence of the Owner, will demonstrate the sprinkling system with particular attention to coverage and method of operation.

35. Adjusting of System

Adjustment of the sprinkler heads and automatic equipment will be done by the Contractor, upon completion of installation, to provide optimum performance. Minor adjustments during the guarantee period will be made by the Owner.

36. Loose Equipment to Furnish

Loose sprinkling equipment, operating keys and spare parts will be furnished by the Contractor in quantities shown on the plans.

37. Instructions and Record Drawings

After completion of the piping installation, the Contractor shall furnish an "as-built" drawing showing all sprinkler heads, valves, drains and pipelines to scale with dimensions where required. Instruction sheets and parts lists covering all operating equipment will be bound into a folder and furnished to the Owner in two copies.

38. Owner's Acceptance

Within ten days of the Contractor's notification that the installation is complete, the Owner will inspect the installation and, if final acceptance is not given, will prepare a "punch list" which, upon completion by the Contractor, will signify final acceptance by the Owner.

39. Guarantee

For a period of one year from date of final acceptance of the Contract, the Contractor shall promptly furnish and install, without cost to the Owner, any and all parts which prove defective in material or workmanship. Draining of the system to prevent freezing in the fall following installation will be the Contractor's responsibility.

40. Owner's Responsibility for Maintenance

It will be the Owner's responsibility to maintain the system in working order during the guarantee period, performing necessary minor maintenance, keeping grass from obstructing the sprinkler heads, protecting against vandalism and preventing damage during the landscape maintenance operation.

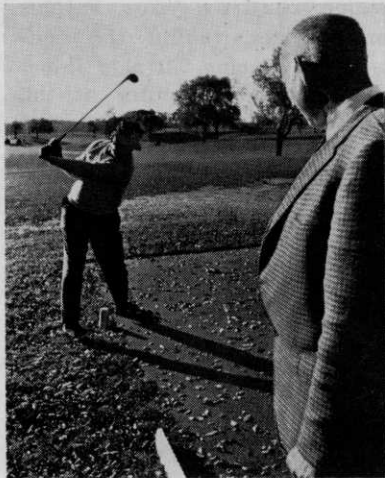
41. Service by Contractor

The Contractor shall service the system at the Owner's request during the guarantee period and shall be paid for work performed which is not covered by the guarantee. If requested by the Owner, the Contractor will furnish the Owner with a schedule of service fees.

42. Addenda

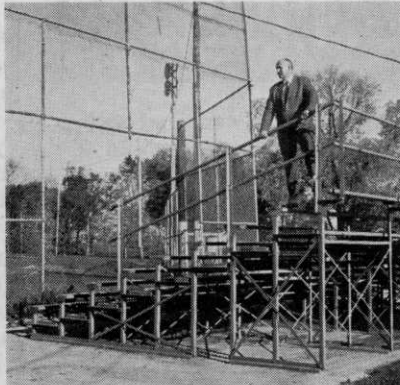


"Those Wheel Horse tractors really work hard keeping the fair grounds in shape for sulky racing and a nine-day county fair."



McCoy puns: "Wheel Horse even helps our golf course stay out of the 'red' by keeping the fairways green."

McCoy added four new Wheel Horse tractors to his stable this year. Here he accepts delivery on a new GT-14 from John Newby, of Implement Service, Inc., in Anderson.



McCoy's park department maintains 38 little league baseball diamonds. Anderson hosted the Babe Ruth League World Series in 1965.



How one city manicures its fair grounds, golf course and 38 parks

"I was put in office to keep our city well-groomed," says Ralph McCoy, Anderson, Indiana, park superintendent. "If my equipment breaks down, I've had it." McCoy depends on his Wheel Horse garden tractors to get the job done eight hours a day, April through November. "I have to get good service out of them because my job depends on it."

McCoy first heard about Wheel Horse from his brother, who had a dealership in Fort Wayne, Indiana. Now he uses six Wheel Horse tractors and a summer staff of ninety men to manicure 700 acres of parks, lawns and golf course. During the winter a Wheel Horse snow thrower attachment keeps the city skating rink clear of snow. "I can't afford equipment that winds up sitting all the time; I know for a fact that Wheel Horse is dependable."

McCoy also has charge of the grounds around the new city hall, the Center Services Building, and the million-dollar Eisenhower Memorial Bridge. "Our garden tractors play a major role in maintaining Anderson's image to the public," he concludes. If the lawns you look after are in the public eye, look to Wheel Horse for top professional help. It's the pick of the pros. Write: Professional Services, Wheel-Horse Products, Inc., 515 West Ireland Road, South Bend, Indiana 46614.



Tractors/Mowers/Snow Throwers/Snowmobiles

ANOTHER WHEEL HORSE PROFESSIONAL

For More Details Circle (109) on Reply Card

By TED WOEHRLE, Superintendent
Oakland Hills Country Club
Birmingham, Mich.

Irrigation by Computer?

IT IS ESTIMATED that 90% of all irrigation engineers and golf course superintendents who ever lived are now alive. New ideas and inventions come nearly every day. By combining all that we know, we could create a "supermachine" of any kind within a given field.

The computer is an example of a supermachine. Look what it has done for the space program and for medicine.

In medicine, the computer aids in diagnosing what ails a patient. Why can't we use the computer to help us diagnose factors affecting our patient—the turf?

At present, we are our own computers. We are always taking into consideration the variables of the day or hour to determine what, when and how much to water, spray or fertilize.

We take into consideration the present weather conditions and tomorrow's forecast—temperature, humidity, wind velocity and direction, light intensity, cloudy or clear, chance of precipitation.

What is the long-range forecast? Weather forecasting at its best is weak, but improving. ESSA satellites help a great deal. Perhaps our own weather recording devices or stations would be an improvement.

Soil conditions have to be considered—soil temperature, moisture, compaction (which changes during the summer), and soil porosity.

We look at the turf. What is the height of cut, root depth, grass temperature, rate of growth (fertility and health are related to rate of growth), when was it last mowed,

and when will it be mowed again?

One sensing device we could use to better judge soil and turf is the tensiometer. It determines evapotranspiration, the loss of water from the soil by evaporation and by transpiration from the plants growing from it.

Infrared photography, used to measure the heat or temperature released by the plant, could predict grass that is about to wilt.

Agriculture is using this machine, called a spectrometer or a spectrophotometer, for detecting varying temperatures between healthy and diseased plants. Many times this can be done before noticeable damage is observed by the human eye. The information is then transferred to a thermograph and then read from a color picture.

A wilt-warning device could provide computer data by recording conditions when wilt last occurred. A computer programmed with this information and linked with the sensing device could then warn when these conditions, even though made up of different variables, was about to reoccur.

Some predetermined constants must be considered. These concern soil, turf and the physical layout and design of the system. Soil porosity can be determined mechanically in the laboratory. Percolation rate can be determined in the field, with variances noted between areas.

All USGA greens built with the same set of specifications should be similar enough to get by with the use of one tensiometer for the greens. Most courses would need

more. The effect of diseases on the plant would have a direct bearing on the needs of irrigation. Now, the tendency is to over-water. A computer would lessen this tendency.

Some of the limiting factors such as amount of water, pipe and pump sizes, money available could be handled more efficiently by a computer.

Another variable to know is whether the soil can absorb the water as fast as it is being applied. Should we split or repeat our application, in other words recycle?

The more variables we encounter the more difficult it will be to program a computer.

Imagine reading your various sensing devices, taking the constants, then placing all this information into the computer at the day's end to obtain in a few seconds your instructions for watering that night. It may say something like this:

Water Numbers 9, 1 and 18 greens 1½ hours in three split applications. The approach and the tee end of Number 5 needs an extra 20 minutes. The remainder of the greens and fairways need 45 minutes. One constant application will do. Start the program on the greens at 7:40 p.m. Do the fairway program after the greens. The tees should be started by 3:15 a.m. because you have a shotgun start at 6:30 tomorrow morning. This will still give you enough time to syringe all areas by 5:30 and begin mowing greens and fairways. Have a good night's sleep.

Until all this happens, we can cut a program on a card or tape and place it into the controller for the nights program which you would have to make up from information from our own computer (our head).

If the housewife can have 14 different selections on her modern washing machine, why can't we have a similar dial or programmer built into our controllers? Maybe one setting would be for tees and greens, another for just fairways, or another for greens and half the fairways.

Turf irrigation is full of magical things patiently waiting for someone to discover and apply them. We as superintendents must keep on top of the equipment available and apply them as we see fit. We and we alone can tell the designers and the installers what we need and what we want. They are capable of doing just about anything.

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even woody species die when Tandex is applied. And its power persists for a season or longer.

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Industrial Chemicals, Niagara Chemical Division, Middleport, New York 14105

By AUSTIN J. MILLER, President
Miller Sprinkling Systems
Royal Oak, Mich.

EVERYONE these days is looking back at the 60s and reviewing the accomplishments in a particular field. Let's see how far we've come and what we have learned about golf course irrigation.

While industrial plants and home lawns were watered automatically in almost every instance, the spring of 1960 found the golf courses watering with quick coupling sprinklers if they had an up-to-date system and others using hundreds of feet of hose.

Cost of installation was of only relative importance. The real reason for so few automatics in the early 60s was the reluctance of the superintendent to trust his watering to anyone but faithful old Joe, the night watering man.

Well, old Joe is gone, wages are up, people don't want to work at night, so now the superintendent asks, "maybe I should look into automatic control of my watering program." In addition to replacing old Joe, he'll get variable timing over the whole course, multiple light waterings for the hard to penetrate areas, automatic or manual syringe cycles, automatic rain cut off and no more chance to blame some loss of turf on a poor irrigation system.

So, to sum up the 60s we have had some advances in the hardware of automatic control. The sprinklers have been improved, automatic valves are better, automatic controllers are so reliable that you can almost forget about maintenance. Engineering designs are really ahead of the equipment available. The end of the 60s saw central programming designed into almost every new installation. From the superintendent's office, he can handle the irrigation of the entire course. Really, what we accomplished in the 60s was the realization that a golf course can be watered using an automatic, easily adjusted program.

What lies ahead for the 70s? Plenty of research. We still don't know how often to water and how much to apply. Most superintendents are watering by using their judgment, based on experience and not supported by any technical input. Here we have \$150,000 worth of sophisticated equipment and the superintendent still has to look at the turf, look at the sky and guess "it looks like 30 minutes per station would do the trick tonight."

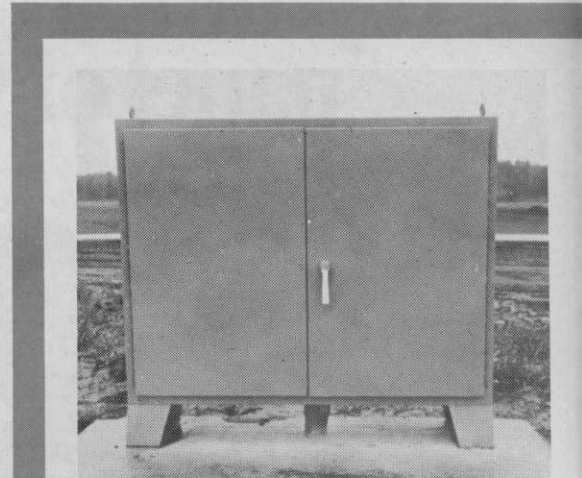
Among other things, for any given course the amount and frequency of water required depends on soil mois-

ture level, rate of evap-transpiration, wind speed and direction, length of day, amount of sunlight or cloud cover, relative humidity, soil and air temperature and weather forecast for next 24 hours.

Each time the superintendent decides to water, he has to evaluate all of these factors. Most superintendents are very capable but to analyze eight or more variables and remember the relationship of each variable to the water required for his grass, is too much to ask of anyone.

Why not have a digital computer receive the input of the various sensing instruments and then control the watering time based on the analysis of all variable factors. These computers are now leased by some clubs and, if not, are available on a time-sharing basis in most larger metropolitan centers.

Again, our hardware is ahead of

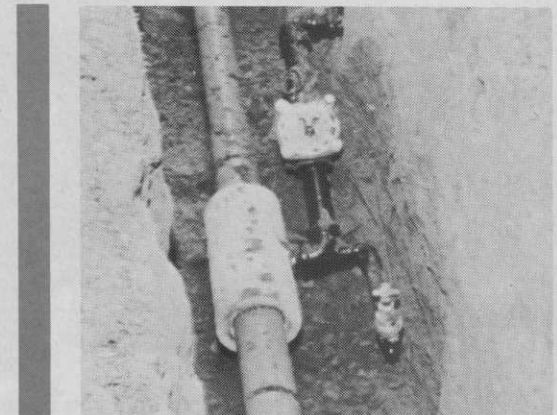


This National Electrical Manufacturers Association specification cabinet provides an attractive as well as functional housing for irrigation controller units. It gives weather and vandalism protection. It's equipped with a ground rod.

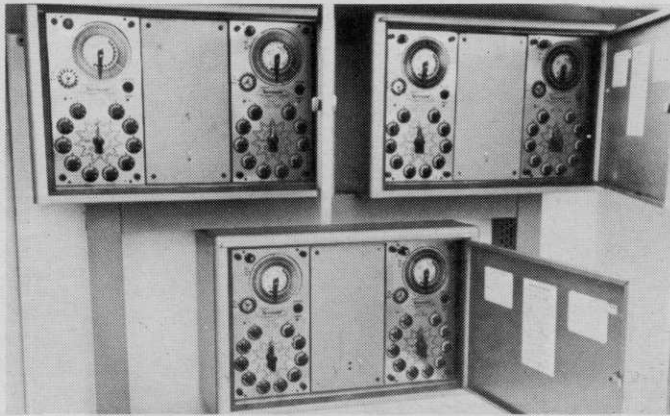
Golf Course Irrigation: **GOOD IDEAS**

our software, or program. Even if we know that the soil moisture is at the 47% level, wind 6 mph from s.w., 14 hours daylight with 60% sun, average 51% relative humidity, average temperature 76 degrees and forecast for tomorrow to be same with 10% chance of rain, the superintendent still can't say exactly how much water to apply, knowing his grass and soil type and management level desired.

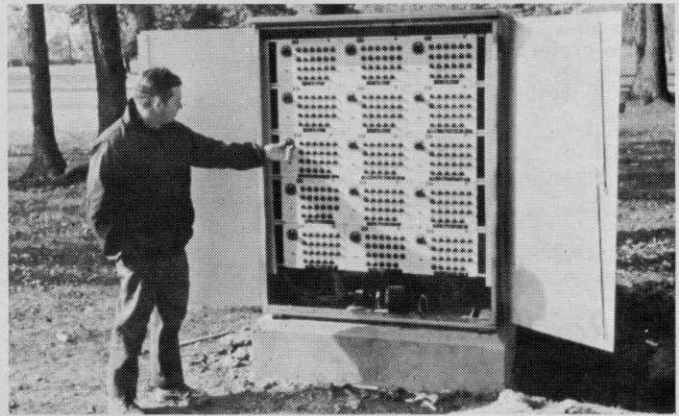
For those superintendents who are the serious leaders, I suggest you start recording some or all of the data listed above and then record the response of your turf, together with the amount of water applied. You'll be assembling valuable data for later design of your automatic watering program, and in the meantime, will be giving your head a good workout while using it as a low-cost computer.



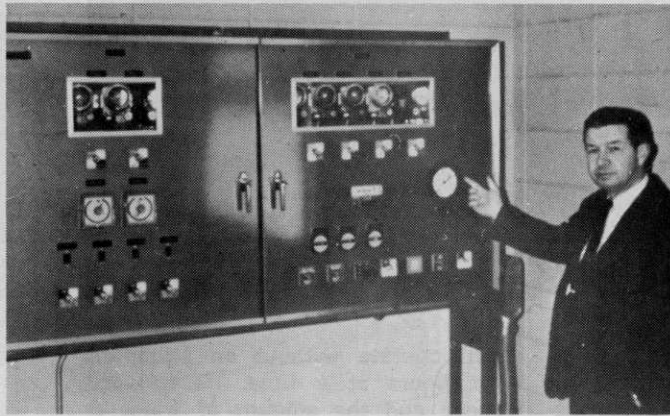
PVC pipe installed in 80-90 degree weather in a 400-yd fairway may shrink 24 inches when the temperature drops to freezing. A rubber ring joint accommodates expansion or contraction, relieving stress that could cause line rupture and repair costs multiple times above the coupler price.



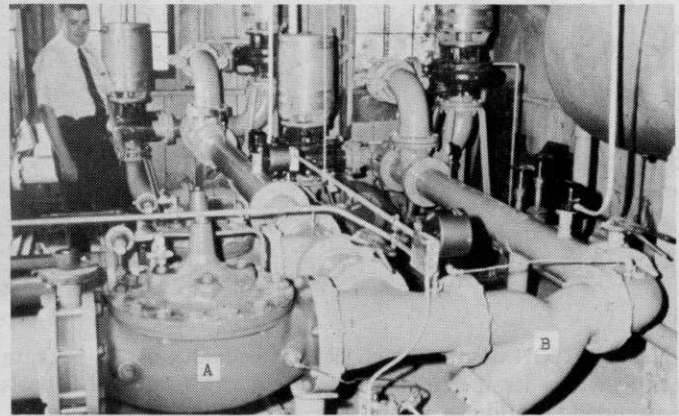
Three or four Rainmaster controllers—or similar products—will fit snugly inside the electrical cabinet shown at left. The system here has separate clocks for greens, tees and fairways. More than 65 wires are coming into this unit. Field controller installations can easily be blended in with the course through proper landscaping.



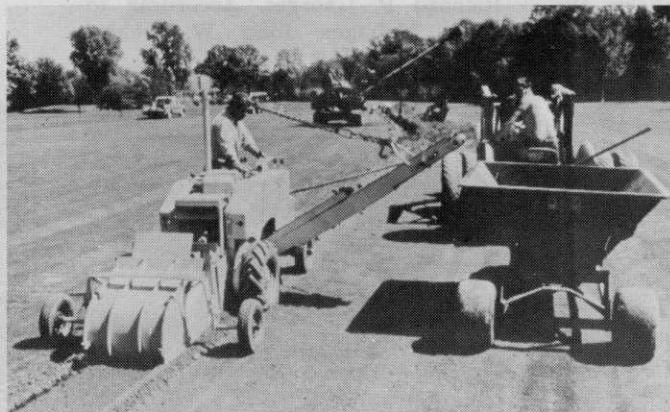
Bob-O-Link Country Club at Highland Park, Ill., is using this larger, more sophisticated field controller installation. This unit provides one program for fairways and approaches, four preset programs for greens, and four preset programs for tees. Bob-O-Link also has telephone contact between field stations and the superintendent's office.



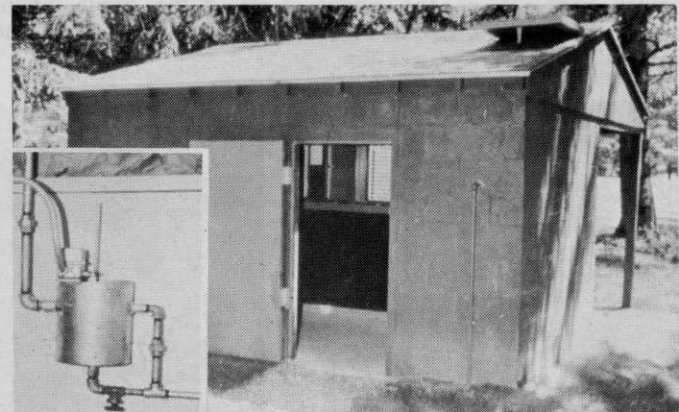
Robert Williams, superintendent at Bob-O-Link, points to the central program unit that operates his field controllers. This system provides automatic or manual start, individually, for greens, tees, fairways and approaches for both the irrigation and syringe cycles. The unit has a series of red alarms to indicate malfunctions.



Clean water at a constant pressure is a necessity for trouble-free golf course irrigation. Oak Hill Country Club, Rochester, N.Y., obtains these requirements with a pressure regulating valve (A) and a Y-type strainer (B). The strainer features an automatic blow-off to remove collected contaminants.



This trench cleaner is a modified footing digger, made by Arps Mfg. Co., New Holstein, Wis. It prepares the trench with a one-inch depression to allow for the replacing of sod. Excess dirt is augered into the wagon. Used with a backhoe and tamping unit, the trencher enables replacement of sod in less than three hours.



A field control house serves the double purpose of housing irrigation controllers and as a shelter for golfers. The house at Oak Hill Country Club features a rain gauge on the roof that operates an automatic shutoff (inset) for the sprinkler system. The unit is adjustable from .15 inch of rain. It shuts off system and returns controllers to start position.

As the water gun atop the Turbo-Rain unit revolves, it lays down as much as 500 gallons of water a minute. It will operate unattended for hours at a time, advancing across a field according to a preset speed.

Turbo-Rain Gives 24-Hour Unattended Large-Area Irrigation

By EDWARD G. DICKSON
Hialeah, Fla.



AN IRRIGATION device which literally walks itself across a field — unattended — while a water gun mounted atop it sprays up to 500 gallons of water a minute is being introduced to a variety of agricultural uses.

Turbo-Rain, built in Winter Haven, Fla., to help alleviate the critical manpower problem of the citrus industry, is being used, too, in other

activities — to irrigate row crops of many kinds, and pastures. At least one unit has been sold for irrigating a sod farm. Conceivably, its builders say, it could be a water source for a variety of turf locations, including parts of golf courses.

Once harnessed by "mobile pipe" to a water pumping station and with its guide cable anchored in the ground ahead of it, the Turbo-Rain

will operate without an attendant for hours at a time. Its forward speed and the amount of water it lays down can be determined at the outset by a valve adjustment. It will operate at night as well as during the day, the makers say.

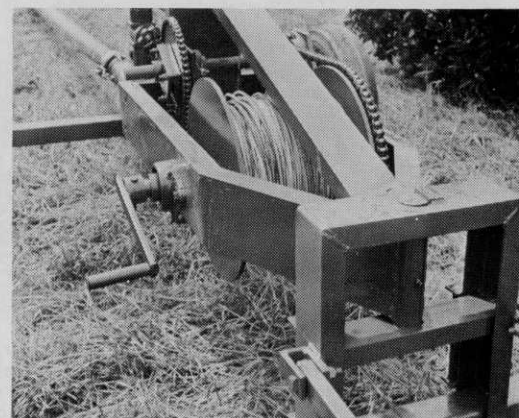
Turbo-Rain is manufactured by Hydro Equipment Co., headed by Richard P. Georges. According to Sales Manager John W. Baker,



John W. Baker, sales manager, points to Turbo-Rain design features — a water turbine and gear box. The gears are driven by the turbine and pull the wheeled machine along a long steel cable.



Forward movement of the Turbo-Rain can be adjusted with this by-pass valve. The valve regulates the amount of water passing through the turbine, thus changing the "walking" speed of the machine.



The steel cable on which the Turbo-Rain "walks" itself is reeled in on this drum, at the forward end of the irrigation machine. The end of the cable is anchored in the ground.

about 200 units of the irrigation machine are in use. Some have been shipped as far away as Argentina.

The irrigation system, he said, is being used in the peanut fields in Georgia, on vegetables in California and Michigan, on grain fields in the Midwest, as well as in the Florida citrus groves. One sod farm in Georgia has purchased the equipment, Georges said. A Florida horse farm is using it for pasture.

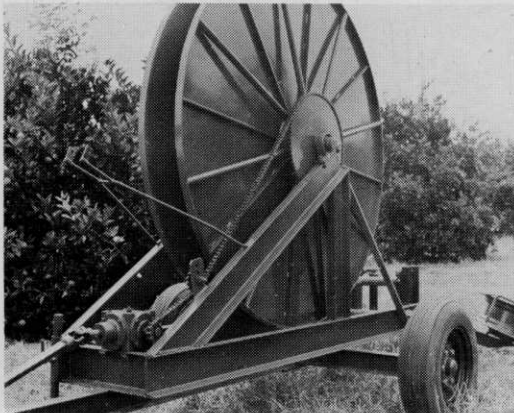
There is a common denominator in all these uses—to provide irrigation without requiring a workman in constant attendance and without having to install a permanent system.

An ideal application, Baker said, would be a square 40-acre field of reasonably level ground and uninterrupted straightaway runs for the Turbo-Rain.

If this field were broken up into four areas, each 330 feet wide and 1,320 feet long, the Turbo-Rain could make a pass through one of these areas in 12 hours comfortably. For example, this strip could be watered during the night without any supervision except at the start. It would shut itself off at the end of the job.

Key feature of the machine is the water turbine. Water from the pump enters the turbine from the hose which connects the pump and the machine. The turbine action turns gears in an attached gear-box. These gears, in turn, pull the machine along a 1-4-inch galvanized cable, 1,400 feet long, which is anchored in the ground ahead of the Turbo-Rain.

A by-pass valve, which controls the amount of water going into the turbine, makes it possible to vary the forward movement of the machine from 6 to 60 inches a minute. The water gun has a 1¼ nozzle and has maximum water coverage of



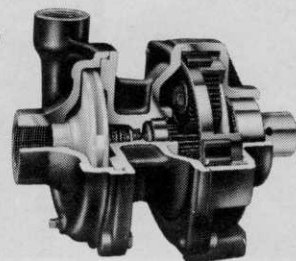
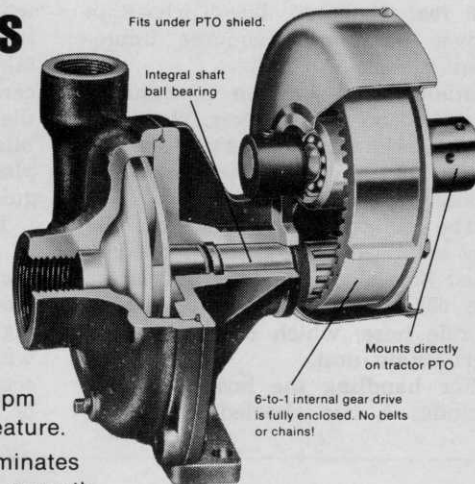
This is the hose reel unit operated from the power-take-off of the pulling vehicle. This unit is owned by Green Swamp Grove of Harmon Brothers, Winter Haven, Fla.

Hypro announces a gear-driven PTO centrifugal sprayer pump for only \$90

It's the 9100, Hypro's new PTO centrifugal pump that delivers 20 gpm at 50 psi. Compare it, feature for feature.

Totally enclosed gear drive eliminates belts, chains, and pulleys. With smooth-running gears, ball bearings, mechanical seal, and precision molded impeller, it handles wettable powders and other abrasives with less wear.

The 9100 is compact, only 10" high, 6¼" from PTO center to bottom of pump. Mounts easily on the PTO and fits under the safety shield.



For higher capacity: Hypro Series 9000 now available for 1000 rpm PTO as well as 540.

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23

500 feet diameter. The Turbo-Rain moves on four pneumatic implement tires.

Maintenance on the machine is slight, according to Baker. There are five grease fittings to service and the grease in the gear-box must be changed periodically.

The pumping equipment can be any standard type. The water flow must be reduced to four inches for the 630 feet of non-stretch 4-inch mobile hose, which reaches to the Turbo-Rain unit.

For handling the hose, the unit includes a two-wheeled hose reel,

which can be pulled by a tractor or truck and is operated by power take-off. It can lay the hose in the center of the row or at the side of the row. Also for handling the mobile hose are two capstands, usually placed at the ends of the runs to guide the pipe on turns.

The company also makes a model of the Turbo-Rain for groves or orchards with tall trees. On that model the water gun is located much higher and the machine is equipped with counter-balancing tanks to compensate for the greater height of the unit.

Hydro Equipment Co., is a division of Superheater Sales Co., which produces a crop protection system.

National distributor (outside of Florida) for Turbo-Rain is Ames Irrigation Co., of Gainesville, Fla., a division of Rucker Co., of Oakland, Calif.

Tree Odor May Help Solve Air Pollution

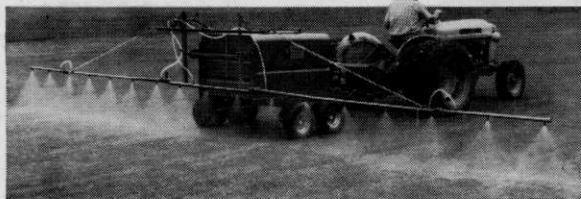
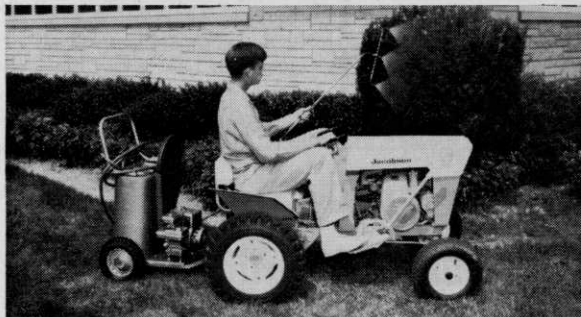
Strange as it may sound, the taste and smell of trees may provide the key to solving many of the problems man faces today.

James Hanover, associate professor of forestry at Michigan State University, says that leaves and stems of trees give off vapors which often result in a unique odor associated with individual trees, species and large forests.

Only recently, the potential significance of these vapors for problems of insect attraction, human allergy, atmospheric contamination and ecological regulation has been realized.

An instrument called the gas chromatograph, which is far more sensitive than the human nose, is being used to measure tree odors and determine their chemical composition. Further study of the different odors given off by different trees will give insight into specific ecological problems.

"Corresponding measurements of the 'taste' of internal chemicals of tree tissues are also being conducted," says Hanover. "Eventually, the chemical codes which determine whether certain trees are resistant or susceptible to damaging diseases or insects may be unraveled and used to improve the environment."



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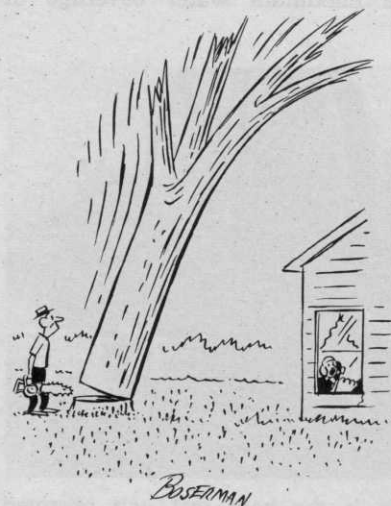
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Or, if you've sprayed, and the broad-leaved weeds and brush still abound...

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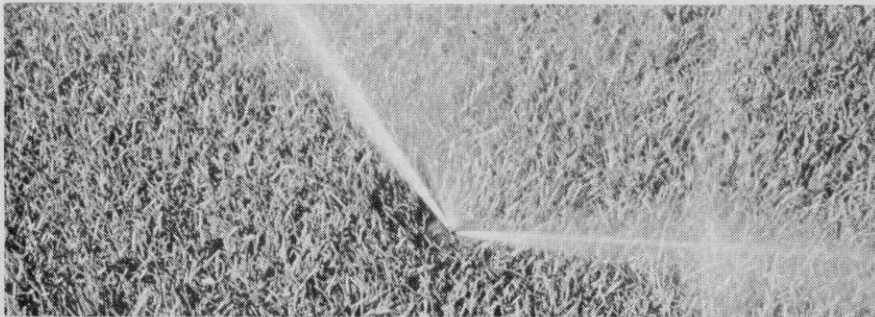
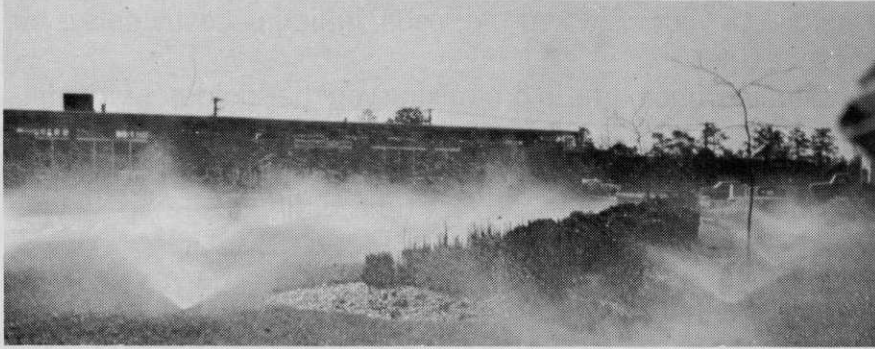
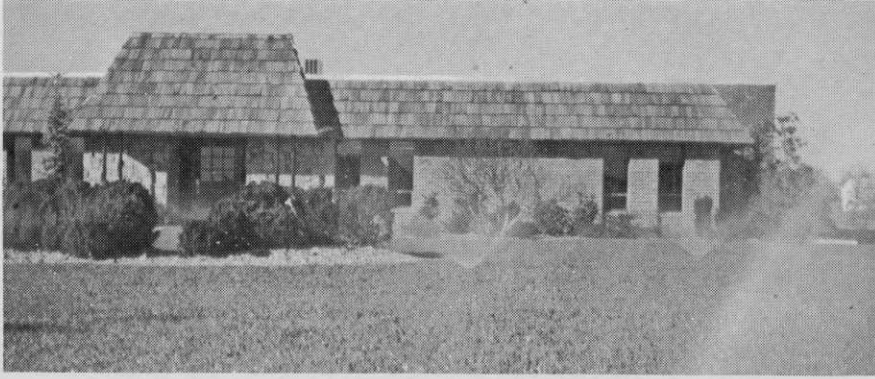
Visko-Rhap, in special formulations of 2,4-D, 2,4,5-T, and Silvex, from Hercules.

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Beauty, Upkeep, Status Push Turf Irrigation

By A. BROWN, Vice-president of Sales,
Turf Irrigation Corporation
Commack, N. Y.

UNDERGROUND sprinkler systems are becoming more popular with commercial and industrial firms whose buildings are surrounded by large turf areas. Pride seems to be the foremost factor contributing to the trend.

This desire for appearance perfection is becoming a must in the industrial parks that are springing up throughout the country. Wide acceptance and usage of underground sprinkler systems for commercial grounds is yet to come. Therefore, phenomenal growth is ahead, with these factors bringing on the expansion:

—labor savings for turf maintenance;

—a genuine desire for a more beautiful plant site;

—recognition that well-groomed and landscaped grounds project the image of an affluent company; and

—the emergence of beautification as a popular status symbol.

Commercial site irrigation will experience the same type of success as has been achieved by color television. One commercial firm installing a system will inevitably motivate others to do the same. The trend can then snowball.

A large number of commercial installations have come as the result of the beautifying effects of systems for private homes of busi-

ness and professional people.

Proper installation is an excellent entree for subsequent jobs.

It is important for the installer to visit the job site in order to design the sprinkler system effectively around the present or proposed landscaping.

Catalog specifications for sprinkler heads should be followed closely. For example: Turf Irrigation sprinkler heads are equally spaced 24 feet apart; and rotary heads are equally spaced 36 feet apart to allow for proper water overlay.

Installation is quite simple. Introduction of trenching machines and sod cutters has practically eliminated menial labor.

Complete automatic electric systems are set for proper watering in the spring and aren't touch again until fall.

After a system is shut down, it is imperative to blow out the lines to prevent ice damage to valves, lines and heads during winter.

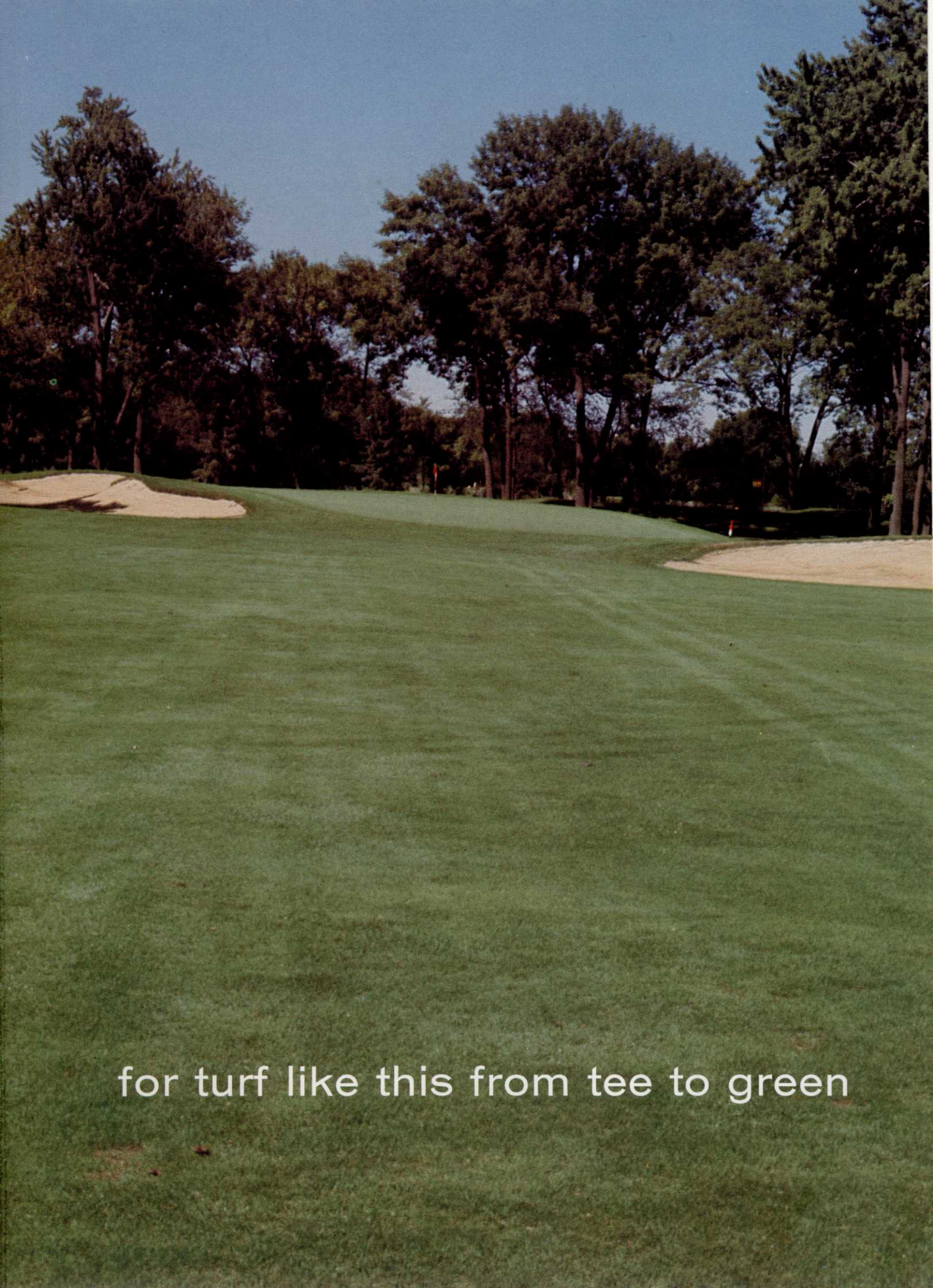
To insure that a system is maintained properly, it is important to discuss the system in detail with the man charged with its maintenance. He should know, for example, how and why the electric valves and controller operate. This effort will eliminate a large percentage of call backs.

Turf Irrigation Corporation has arranged a school and field trip program to orient purchasers of its products.

Selling cost for installing a commercial job, in round numbers, is about \$2,000 per acre for rotary pop-up heads and \$3,000 per acre for automatic pop-up heads. This is based on one- to ten-acre plots. The estimate includes the electric valves, electric controller, poly pipe, pipe fittings, etc., predicated from existing water service.

Evidence of this expanding industry of commercial turf irrigation has come through our experience with several relatively new sprinkler installers. With a year's concerted effort, they have seen business increase within a short period to a full-time endeavor.

Turf Irrigation Corporation's growth also reflects the trend. Consolidated sales of all our divisions for 1968 showed a 60% growth over the previous year. Backlog orders going into 1969 were about 200% greater over a year ago, attributable in part to 35 new items added to our product line in 1969.



for turf like this from tee to green



follow the

TUCO **Acti-dione**[®]

fairway spray program

The same antibiotic fungicide proven for years on golf greens at *hundreds* of courses now provides a program for economical treatment of fairways.

NOTE: The cover photo, the untreated fairway at left and the closeups below were all taken the same day in August, 1968, at courses less than 40 miles apart. All are untreated. Below left is bluegrass; right is bent grass.



why a fairway **disease control** program?

1. Golf course superintendents set increasingly demanding standards for themselves to provide superbly conditioned courses regardless of weather and other obstacles.
2. Demand by golfers for high-quality turf at all times. They want the good lie for fairway woods and iron shots.
3. Growing numbers of golfers increase this pressure, and increased traffic is too much of a challenge for anything less than healthy turf.

why **Acti-dione**® for a fairway spray program?

The use of Acti-dione Ferrated or Acti-dione RZ has demonstrated effective, economical control of many turf diseases when combined with good management practices.

Acti-dione Ferrated is a formulation of the antibiotic Acti-dione and Ferrous Sulfate designed for the control of specific turfgrass diseases. Acti-dione RZ is a broad spectrum turf fungicide formulation containing the antibiotic Acti-dione in combination with PCNB. Both products are used in a preventive and eradivative treatment program for:

Kentucky Bluegrass—leafspot, going-out, and melting out
Merior Bluegrass—rust, fading-out and powdery mildew
Bentgrass—dollarspot, melting-out and fading out.



how to use **Acti-dione**® in a fairway spray program

Acti-dione may be applied as a spray with a conventional boom sprayer or with a broadcast boom jet spray nozzle. The Acti-dione spray should be allowed to dry in the grass—do not water in.

Your fungicide program should begin in the spring as soon as possible after the first mowing. Succeeding applications should be made as often as necessary throughout the growing season. Usually an interval of 21-30 days between applications will maintain satisfactory control. The recommended rate of Acti-dione Ferrated for fairway disease control is one package per acre; the recommended rate of Acti-dione RZ is 1.5 pound per acre.

Prepare a fresh solution each day spraying is done; use at least 30 to 40 gallons of water per acre. For severe disease infestations, increase dosage rate of Acti-dione Ferrated to two packages per acre. If you are using Acti-dione RZ, one package of Acti-dione Ferrated per acre may be added as a tank mixture to increase effectiveness.

When mixing Acti-dione for fairway spraying:

1. Fill the spray tank $\frac{1}{2}$ full with clean water
2. Start agitator and add the recommended amount of Acti-dione for the number of acres you plan to spray
3. Add remaining water while agitator is running

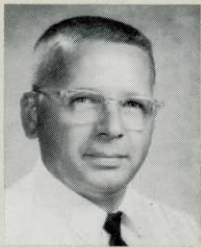
For sprayer calibration, request our Acti-dione sprayer calibration guide.



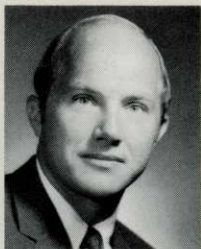
When it comes to turf problems—



STANLEY CAPLAN has a B.S. in agriculture from Delaware Valley College of Science and Agriculture in Doylestown, Pennsylvania. Stan has had several years of experience as a manager and buyer of nursery and garden supplies for a large company in California prior to joining TUCO in 1965.



HENRY LYON graduated from Cornell University with a major in ornamental horticulture. He has a broad agricultural background which includes wholesale sales and garden store management. Henry has been with TUCO since 1964.



ROBERT SCOBEE was raised on a golf course (his father is a superintendent). Bob graduated from Purdue University with a degree in agronomy. Former secretary of the Indiana Golf Course Superintendents Association, Bob is a member of the Golf Course Superintendents Association of America. Bob has been with TUCO since 1965.



THESE MEN
UNDERSTAND
AND CAN
HELP!

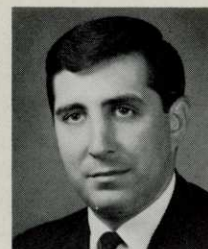
TUCO realizes maintaining healthy, top quality fairways, tees and greens is far from easy. That's why this outstanding team is available to help you with your turf growing problems. Just a call will put one of these highly trained and experienced men to work for you. TUCO has the products and the personnel to do the job.



CARMEN BOONE is a native of Arkansas and studied at Arkansas A & M College. He has a broad agricultural background and has had experience in the agricultural equipment field. Carmen joined TUCO in 1968.



CARL MARTIN is a graduate of Texas A & M University with a degree in entomology. Carl is exceptionally well versed in the field of Entomology. He is a member of the Entomological Society of America and has been with TUCO since 1964.



ROBERT LIPPMAN is an honor graduate of Pennsylvania State University's turf management course. While attending college, Bob was awarded a scholarship and certificate of merit from the Golf Course Superintendents Association of America and has had actual field experience as a golf course superintendent. He is a member of the Metropolitan Golf Course Superintendents Association and the Hudson Valley Golf Course Superintendents Association in New York state. Bob joined TUCO in 1967.



Industry People On the Move



Environmental Industries, Inc., Encino, Calif., has appointed Don Stockard to manage its planned garden center operations. EII owns Valley Crest Landscape, Inc., Curtis V/C Corporation, and Valley Crest Tree Company. Its retail garden center business arm is to be called "The Arboretum, Inc." Operation will be statewide from headquarters in Van Nuys.

* * *

Valley Crest Landscape, Inc., a division of Environmental Industries, Inc., Van Nuys, Calif., has named A. J. Lastuck, vice-president, as the Los Angeles divisional manager. Valley Crest is a state-wide landscaping, irrigation, and engineering contracting firm.

* * *

Amchem Products, Inc., Ambler, Pa., has appointed two sales representatives. Donald D. Richardson of Chesterfield County, Virginia, has been assigned to the state of Virginia and portions of North Carolina. Thomas J. Zielinski of Bay City is the new sales representative for Michigan.

* * *

Alco Chemical Co., Artesia, Calif., has appointed Philip Dellner as a technical sales representative for Orange, San Bernardino and parts of Los Angeles and Riverside counties.

* * *

Ian M. Wedderspoon, native of Scotland and a graduate assistant in the University of Maryland's Department of Agronomy since 1968, has been appointed supervisor of weed control inspection for the State Board of Agriculture. He is completing his master's degree in weed control and plant physiology.

* * *

Missouri Botanical Garden Board of Trustees has announced these officers for 1970: President — C. Powell Whitehead, chairman of the Arts and Education Council of Greater St. Louis; first vice-president — Tom K. Smith, Jr., group vice-president, Monsanto Company; second vice-president — Samuel C. Davis, retired senior vice-president, St. Louis Union Trust Company.

* * *

Toro Manufacturing Corporation, Minneapolis, has appointed P. Robert Scagnetti as institutional mower sales manager for the turf products division.

* * *

Heath International, Richmond, Mich., has selected Kenneth W. McCoy to head its newly formed industrial sales division. McCoy comes from Velsicol Chemical Corporation, where he was corporate manager of sales information.

* * *

Midwest Association of Golf Course Superintendents has selected Mrs. Dorothy H. Carey as executive secretary. Mrs. Carey has similar responsibilities for the Chicagoland Golf Association, the Sod Growers Association of Mid-America, the Southwest Golf Association and the Illinois Turfgrass Foundation.

* * *

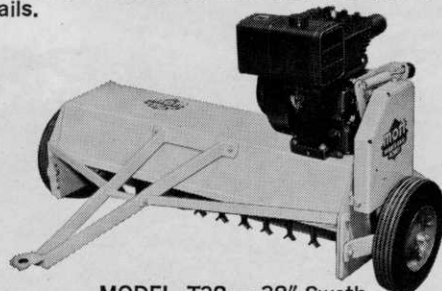
Nutro Turf and Garden Products, Columbus, Ohio, has appointed Harry F. Podvia as a territory manager to establish and supervise sales in western Pennsylvania.

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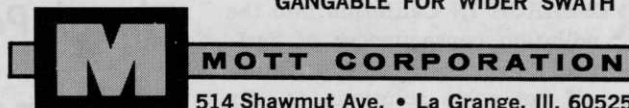
The knife-like flails of the MOTT system, with their edgewise slicing action, cut cleaner and use less power than other type flails.



MODEL T38 — 38" Swath

Double up on performance. Let your tractor do the pulling. Let the MOTT T38 do the mowing. The mower engine operates independently of the tractor, delivering its full capability of power and speed to the cutter shaft at all times, even when the tractor engine itself is throttled down. This combination gives a versatility of performance not possible with tractor powered mowers.

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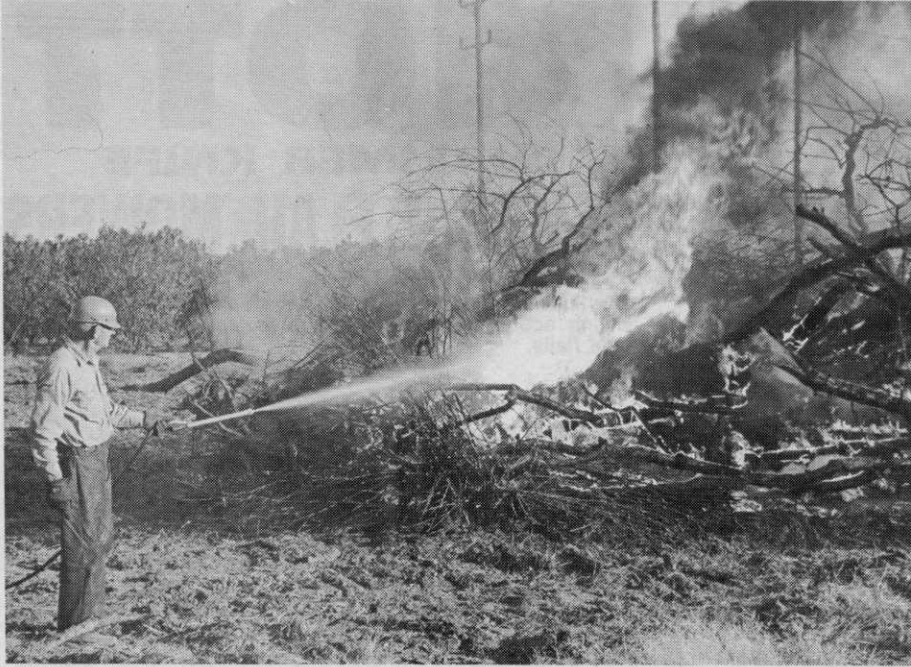
Chanderlin also has sod quality blue grass, Fescue, and Merion Blue for Certified Sod Production.

So if you're going to seed, look to Chanderlin for high quality grasses. And attractive prices.

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While wood and field burning in general is not a major contributor to photochemical air pollution, uses of some fuels in those fires can be. This Californian is creating a smoke plume that is visible for miles. He's trying to keep

the fire hot enough to burn some orchard trees. Discarded auto tires, used for years to keep fires hot, are going to be outlawed. Authorities say there are other ways to keep fires hot without causing obnoxious pollution.

RESearch IN California into the pollution consequences of agricultural burning may offer some solace, if not some solutions, to city officials and others who must dispose of diseased street and ornamental trees.

The fact is, clean burning of woody materials may not be as much a contributor to dangerous types of air pollution as has been assumed.

For some areas, such as those where trees afflicted with Dutch elm disease must be destroyed, the only sure method of eradication is burning. Yet, states and the federal government are moving rapidly toward the elimination of open burning as an air pollution control measure.

Several points with respect to burning wood wastes are worth remembering by city street tree maintenance men and others who have burning to do but hope to avoid the wrath of air pollution control authorities.

—Burning should be done on a somewhat breezy day when there is

Though Pollution of Air Is Low,

Where There's Smoke, There's Fire of Protest

By THORNE B. GRAY
Modesto, Calif.

no inversion layer to keep smoke from dispersing.

—Fires should be kept as hot as possible, but without using such controversial measures as throwing rubber tires or smoky fuels into the fire.

—Fuel should be as dry as possible before the fires are lighted.

If these rules are followed, a strong case can be made that such fires do not contribute appreciably to the air pollution problem.

To understand why, it first is important to know the difference between particulate air pollution and photochemical air pollution.

Briefly defined, photochemical air pollution is the chemical product of the mixture of some pollutants, mainly hydrocarbons, and sunlight. The common term for the resultant material is smog, and even a small amount of smog can be harmful to humans and plants. A level of .15 parts per million will cause eye irritation.

Causes More Barking Than Bite

Particulate air pollution, on the other hand, often causes more public outcry and anguish than does actual smog. In many areas, particulate air pollution is severe and dangerous, especially when emissions fail to disperse or where they affect urban populations. In the great Central Valley of California, farmers are faced with learning to conduct necessary burning while not causing visible or harmful particulate pollution, and they are having some success.

“As far as particulate matter is concerned, as far as aesthetic values and their impairment and the effects on visibility, no one I know of, who is a responsible person, will deny that agricultural burning doesn't contribute,” admits Victor P. Osterli, a researcher with the University of California extension service who has done substantial work on air pollution and farm burning.

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- For any soil condition
- No skill required
- Quickly on or off
- Controllable tilt

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MINNEAPOLIS, MINNESOTA 55424

"But from the standpoint of gaseous emissions, of hydrocarbons particularly, when you consider quantitative emissions from a given volume of plant wastes, smog generation is small by comparison with the internal combustion engine source," he said. "Likewise, smog production gets smaller yet when compared with the total volume of gasoline usage in a metropolitan area and its surroundings."

Osterli's office at the university's Davis campus is in the center of the rice producing area of the Central Valley, and rice stubble burning often has been an acute problem for farmers and their city neighbors. Other farmers must annually burn orchard prunings and there is a continuing need to burn entire orchards which have been removed to make way for new crops.

Thus far, neither the state nor counties in the valley have seen fit to abolish rice field or other agricultural burning. Instead, some effective voluntary controls have been devised with the help of the weatherman.

Ventilation Index Established

A ventilation index for each day is published by the US Weather Bureau, based on the height of the mixing layer of the atmosphere plus wind velocity, as predicted for mid-afternoon. Values range from zero to 2,000, with the higher numbers representing the best weather for burning. Compliance with the index is voluntary, but well over half the farmers heed it and the results, in terms of air pollution incidents, have been encouraging.

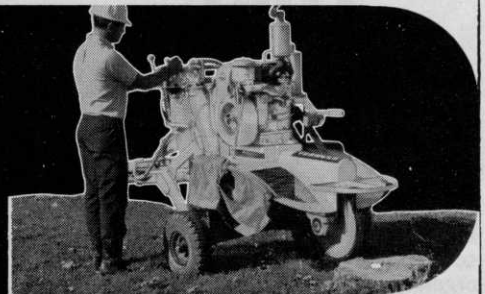
Osterli said in the San Francisco Bay area, the Bay Area Pollution Control District relies on the ventilation index to outlaw all open burning when conditions are unfavorable.

Agricultural burning, of course, involves thousands of acres and often is an annual occurrence. Sometimes the burning must occur in the same months when air pollution is greatest from other sources. In part, controls on farm burning have proved one point: air pollution continues anyway.

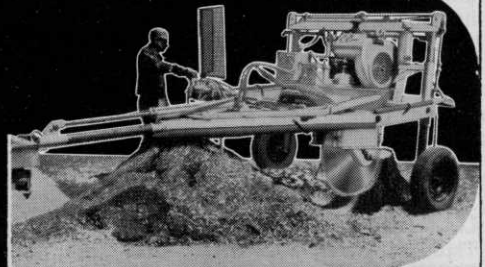
A city fire to remove bark beetles which spread Dutch elm disease, by comparison, would never approach the aggravating smoke levels found in Oregon's Willamette Valley last year, for instance. Grass seed harvesters there burned off some 240,000 acres of stubble last summer when conditions were bad and the smoke drifted over the city of Eugene. On Aug. 12, conditions became so poor

6 Fastest, Easiest and Cheapest Ways to Get Rid of Stumps.

MODEL 6—smallest of Vermeer's Stump Cutters. Designed for those hard-to-get-at places. Rips out stumps 6" below the surface. Low maintenance cost.



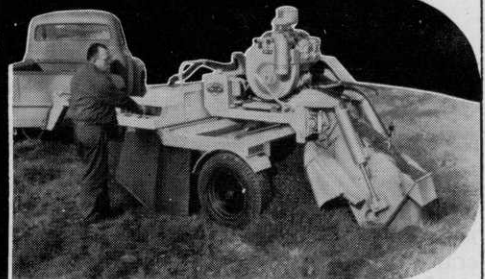
MODELS 10 AND 15 High speed cutting wheel removes largest stump in minutes. Powered by 36 hp engine. Choice of models with 10" or 24" cutting depth.



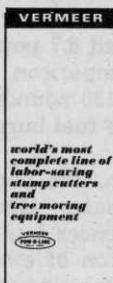
MODEL 1560—This one has 60 hp Wisconsin engine. More speed and more power for heavier work loads. Cuts 24" deep. Great for land clearing.



MODELS 2436 AND 2460 Vermeer's new "reach out" models cut wider, closer and faster. Low silhouette design for "tight spots." Cuts 24" deep, with 36 or 60 hp engine.



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the day was labeled Black Tuesday and the Lane County Air Pollution Control Authority received 2,000 protesting telephone calls. Finally, Gov. Tom McCall declared a health and safety emergency until atmospheric conditions improved.

Burning Tower Tests

Dr. Ellis Darley of the Statewide Air Pollution Research Center, University of California at Riverside, has investigated both rice and grass stubble fires, and other agricultural fires, for several years. Darley and his associates use a burning tower which permits them to measure the smoke ingredients from sample fires. The fires are laboratory versions of those which burn the same ingredients on farms.

Scores of such fires have been tried in the burning tower, and the results show conclusively agricultural burning is a negligible source of photochemical air pollution when compared with the emissions of the internal combustion engine.

Darley hesitates to apply his findings directly to the type of burning which might be conducted by a nurseryman in destroying a city tree — he never has tested the pollution output of any fuel more than two inches in diameter. He is certain the thicker the fuel, the longer the fire will burn and the more pollutants will be created, though how much more is in doubt.

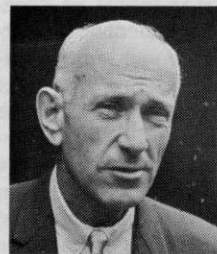
While the State Air Resources Board continues to rely on estimates of such pollutant levels compiled prior to Darley's work, Darley is convinced the estimates are high, even for heavier materials such as orchard trees. "Their estimates don't come out with our measured figures," he said.

Ideal: Hot Fire, Dry Fuel

In general, Darley said the hotter the fire and drier the fuel, the less the pollution. The cooler the fire and wetter the fuel, the greater the pollution. If a fire merely smolders, particulate air pollution can become highly significant.

Fruit prunings, he found, yielded 13.9 pounds of hydrocarbons per ton of fuel burned, barley straw yielded 18.2 pounds per ton burned and native brush yielded 6.7 pounds per ton burned. By comparison, the gasoline engine yields 130 pounds of hydrocarbons per ton of fuel burned, he reported.

For one hydrocarbon, the photochemically active ethane, Darley found the value differences less diverse: 2.7 pounds per ton of ethane were produced in the fruit pruning



Dr. Ellis Darley

Statewide
Air Pollution
Research

University
of California
Riverside

fire against about 7.8 pounds from auto exhausts. Estimating some 151,000 tons of fruit prunings, barley straw and native brush are burned per year in the San Francisco Bay area, Darley estimated some 950 tons of hydrocarbon effluent would be generated per year, an average of 2.6 tons per day. Automobile emissions greatly exceed that figure in the same area on a per day basis.

Withall, the indisputable fact remains that agricultural burning causes substantial amounts of particulate air pollution. Those who light such fires are creating a conspicuous source of pollution, and the finger of blame is easily pointed toward them. The fact that particulate pollution is less dangerous, in many instances, than is automobile-caused smog, often makes little impression on the general public.

To continue burning diseased trees, regardless of how necessary the burning may be to eradication of a disease, nurserymen and tree crewmen will have to carefully marshal facts, arguments and burning procedures which are as pollution-free as possible.

Fast-Growing, Salt-Tolerant Pine Shows Promise at MSU

Michigan foresters and commercial landscapers may soon have a new pine tree.

According to J. W. Wright, Michigan State University forestry professor, the new hybrid cross between Austrian pine and Japanese red pine shows promise for use in pulpwood operations and in roadside plantings.

The hybrid was first discovered in 1961 by MSU foresters at the W. K. Kellogg Forest near Battle Creek. Hybrid trees were growing naturally in an open area between mature stands of Japanese red pine and Austrian pine.

"These hybrids show excellent growth," says Wright, "growing faster than either parental species."

Other characteristics which make the hybrid potentially useful include earlier reproduction, good recovery from transplanting shock and the possibility of tolerance to salt.

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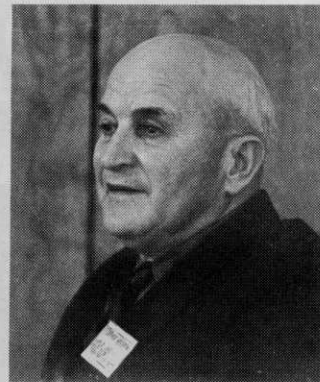
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For More Details Circle (111) on Reply Card

*Disease, Thatch, Pelletized Clippings, Sod Covers
Cicada Wasp, Sod Strength, European Turf . . .*

At Michigan's 40th Turf



These gentlemen, part of the 450 persons attending the 40th Michigan Turfgrass Conference, are listening to a report on European turfgrass culture.

Of course, Clarence Wolfrom was there . . .

EMPHASIS on beautification may be new on the national scene, but it's at least a 40-year-old idea in Michigan.

That's how long the Michigan Turfgrass Conference has been convening. Only Massachusetts can claim seniority, of about a year.

"We saw a need for research and education," recalled Clarence Wolfrom. Fulfilling these original objectives, he continued, "have been the greatest contributions of the conference over the years . . . this plus the experience exchange that goes on."

Wolfrom, superintendent of the Maple Lane Golf Club, Warren, attended the first conference, helped form the Michigan Turfgrass Foun-

ation. He was the first vice-president and served as the second president. He received the Meritorious Service Award last year.

Clarence Wolfrom has attended all 40 of the turfgrass conferences.

He contributed ideas for a course of study for students interested in a career in turfgrass management. A two-year program is now offered that includes both classroom study and on-job experience. Currently, the course has 24 first-year students, 23 second-year students, and more than 30 are expected to enroll this fall.

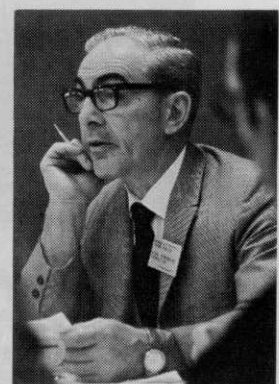
With encouragement backed by financial support (another \$7,200 was voted this year) from the Michi-

gan Turfgrass Foundation, the University has developed one of the best turfgrass research programs in the country. About three dozen major studies are under way.

A steady flow of reports on research progress comes through the University information offices, but the big events are the summer field days and the winter conference.

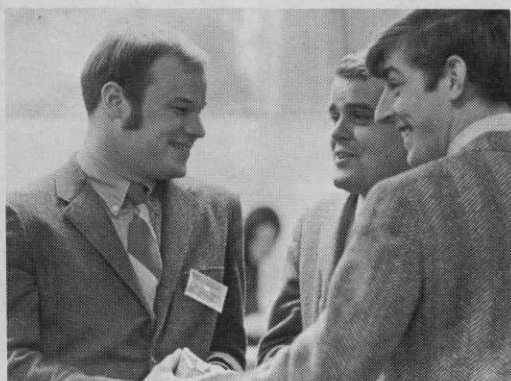
Some 450 persons came to the 40th conference at East Lansing, Jan. 27-28. Sessions dealt with research reports, sports turf, sod production, pest control, and pesticide usage.

Special reports in this issue on irrigation from Carl Miller of Miller Sprinkling Systems, and Ted Woehrl, Oakland Hills superintendent, were a part of the conference



Board of directors of the Michigan Turfgrass Foundation is in session, with representatives of MSU present. From left are Dr. Kenyon T. Payne, MSU; James E. Armstrong, J. D. Armstrong Landscape Co.; Vice-president William Milne, Country Club of Detroit; Dr. Paul E. Rieke, MSU; William F. Miller, ABC Sod Farms; Norman W. Kramer, Point O Woods Country Club; and President Frank Forier, Terminal Sales Corporation . . .

Conference



... As were about 50 students from the turfgrass program.

agenda. Following are glimpses of what else was reported.

Fusarium Blight Increasing

A fungicide to control **Fusarium** blight still defies discovery. The problem, since it appeared in Michigan six years ago, is increasing on sod farms and home lawns. The disease is associated with compaction and drought stress on lawns, said Dr. Joseph Vargas.

Circular rings of dead grass indicate the presence of the disease, which apparently affects root growth. Vargas said shorter roots have been noted in the diseased grass. In dry weather and as the ground dries beyond these affected roots, the plant's leaves wither and

turn brown. Surrounding grass continues green with moisture supplied from a greater depth by longer, healthy root systems.

In the absence of a disease treatment, Dr. Vargas recommended fertilization and daily watering to ease the drought stress.

Dr. Vargas discussed other turfgrass diseases and gave his recommendations of curative chemicals and cultural practices (Table 1).

But chemical companies need to be more specific in pinpointing what diseases their products will cure, stated Dr. Malcolm Shurtleff, plant pathologist from the University of Illinois.

"For which *Helminthosporium* leaf spot" is a chemical effective? he asked. "There are 26 kinds. Which rust? Which smut?"

New Facts on Thatch

A cultural management program to determine how to reduce thatch, after eight years, has resulted in "no observable thatch accumulation," reported David P. Martin.

"Contrary to what has been believed, clippings contribute very little to the thatch layer," he said. Instead, stems and roots are the major contributors.

Up to now, Martin continued, mechanical removal of thatch was the only method known. But research is in progress to determine if thatch can be reduced by increasing the number of microorganism that bring about thatch decay, or to increase the activity of existing microorganisms.

So far, Martin said, "use of sucrose and ferulic acid has almost doubled activity."

Martin hastened to add that "po-



... James D. Standish, III, executive secretary of the Golf Association of Michigan; Jas. W. Smith, Huron-Clinton Metropolitan Authority; Robert Spoelma, Spring Lake Country Club; Roy Peck, Kalamazoo Country Club; Clem Wolfrom, Detroit Golf Club; Dr. Joseph M. Vargas, Jr., MSU; Ted Woehrl, Oakland Hills Country Club; and Dr. James B. Beard, MSU.

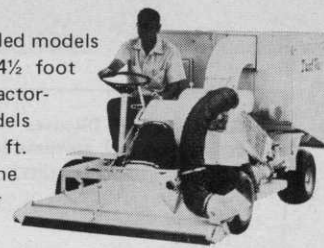
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TABLE 1. Turf Diseases — Chemicals to use; cultural practices to employ.

DOLLAR SPOT

Chemicals:

- Daconil 2787
- Dyrene
- Cadmium

Cultural Practices:

- Maintain fertility
- Remove dew early

BROWN PATCH

Chemicals:

- Daconil 2787
- Fore
- Dyrene

Cultural Practices:

- Avoid high N fertility
- Increase air circulation (trim trees, for example)

LEAF SPOT

Chemicals:

- Fore
- Daconil 2787
- Acti-dione Thiram

Cultural Practices:

- Remove clippings
- Raise cutting height
- Fertilize

FUSARIUM BLIGHT

Cultural Practices:

- Fertilize adequately
- Water daily in hot weather

FAIRY RING

Chemicals:

- Methyl Bromide
- Chloropicrin
- Vapam

Cultural Practices:

- Inject water

POWDERY MILDEW

Chemicals:

- Karathane
- Acti-dione Thiram
- Sulfur

Cultural Practices:

- Reduce shade

SNOW MOLD

Chemicals:

- Calo-gran
- Demosan
- Cadmium
- Calo Clor

Cultural Practices:

- Avoid fertilizing after Sept. 15

LEAF SMUT

Chemicals:

- PCNB
- Benlate

STEM RUST

Cultural Practices:

- Fertilize

Awards included three scholarships from the Golf Course Superintendents Association of America. Recipients are above, from the left, Tony Tredente, Duane Zienert and Mark Fields. John King (far left) is coordinator of MSU's two-year turfgrass management course. Norman Kramer (far right), GSCA president, presented the awards. Dr. Kenyon T. Payne received the Michigan Turfgrass Foundation's Meritorious Service Award and Mike Donahue was named "Outstanding Student."

tential use of stimulators is under further investigation, and the use of these materials is in no way a recommendation at this time."

Sod Clippings Pelletized

Because mowing is necessary to maintain sod quality, work is under way to see if clippings can be utilized in new ways. Dr. M. B. Tesar reported that two tons of pelletized clippings have been obtained. The pellets will be analyzed for total digestible nutrients, essential element content, protein content, and rate of digestibility.

Results to date indicate, he said, that pelletized sod clippings have considerable promise for use in specialized markets and could mean additional revenue for the commercial sod producer.

Coverings Reduce Winterkill

Dr. James Beard reported that his studies of winter protection covers indicate that both dessication and low-temperature kill can be prevented. He has determined that follow-up field testing confirms that cold-chamber techniques are valid in evaluating covers.

Of 16 types of coverings studied, the three best were a viscose-rayon fiber cover, a viscose-rayon-polyester cover, and an excelsior blanket. Some covers brought green-up three weeks earlier, he said.

Again, cultural practices can reduce winter-kill problems, he contended. Choose the proper variety. Seaside, for example, is definitely superior in resistance to dessication, he said. High rates of nitrogen applied just before winter sets in in-

crease the chance of both dessication and low-temperature kill.

Beware the Cicada Wasp

This is the year to watch for the cicada wasp around golf courses, warned Dr. William E. Wallner. The 14-year locust cycle is at hand, and the killer wasps should be unusually active.

The wasps are large, having a wing span of about 1½ inches. And they're capable of a serious sting, said Dr. Wallner.

Broadcast spraying isn't advised. Rather, he said, look for the burrows — the sand traps are a likely place — and apply a diazinon paste to the edges.

Sod Strength Evaluated

Sod heating and sod strength evaluations proved to be of considerable interest in the sod production session.

Dr. James Beard reviewed findings regarding sod strength that were demonstrated at the field day this summer.

The study is based upon only one year's results and final conclusions can't be reached until several more seasons, he said. Nevertheless, these findings have come to light:

— Most cutting height (one-half to 2½ inches) and frequencies (one and two times per week) resulted in an acceptable level of sod strength. The best strength was achieved by mowing at the 2.5-inch height once a week.

— Different varieties produced sod strength from 35 pounds required to tear (South Dakota Common) to 168 pounds (Nuggett), with 75 pounds considered as adequate to permit harvesting, handling and laying

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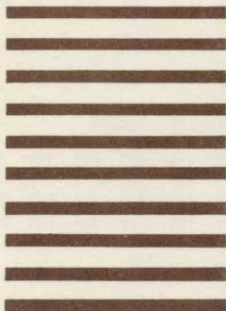
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without problems. The top five varieties, including pounds to tear were: Nuggett, 168; Pennstar, 167; Fylking, 158; Pp-1, 155; and A-34, 146. Belturf, Merion, Captain, PSU k-107 and Jamestown Red Fescue all rated 140 or above.

— Most sod varieties exhibited an increase in sod strength between June and August.

— In a mixture study of six varieties — Fylking, Merion, Newport, Park, Prato and Windsor in 11 different combinations — those blends containing Fylking tended to rank higher in sod strength.

— An evaluation of sod strength for 11 mixtures of Merion and Pennlawn Red Fescue (a sod mixture in demand for areas having both sunlight and shade) disclosed that mixtures containing as little as 30% Merion on a seed number basis gave comparable sod strength to the five highest ranking variety mixtures.

Studies of sod heating since 1966 indicate that:

— Mowing at 0.75 inch and removing the clippings are the most effective ways to reduce sod-heating injury.

— A high nitrogen rate (5 lb. N/1,000 sq. ft.) applied five days before harvest was detrimental to the sod. Respiration rate and percent kill were significantly increased; root production was significantly decreased.

Reports From Europe Trip

Dr. Beard and Dr. Paul E. Rieke reported on their trip to the International Turfgrass Society in Harrogate, England, and a subsequent inspection of turfgrass areas in a number of European countries.

Some general conclusions, they reported, were that the British are considerably behind the U.S. in turfgrass culture and maintenance; that Sweden, in some respects, is ahead of the U.S., particularly in the area of sports turf maintenance.

Solna Stadium in Stockholm, they reported, exhibited excellent grass, despite the fact that 90 games of soccer are played on the field a year. At Soderstadium, also in Stockholm, the field is in use 260 days of the year, to include flooding and freezing it for winter sport games.

At least a couple dozen stadiums were equipped with underground heating systems. Dr. Beard could think of only two or three in this country, one being at Green Bay, Wis., home field of the Green Bay Packers.

Your Reputation as Grower Goes With Handler of Sod

A wise sod producer may conclude that his responsibilities don't necessarily end when he delivers the sod to the purchaser. What happens in the next few hours, days or months could very well damage his reputation through no fault of his own.

These inferences come from the remarks of Ben Warren, president of Warren's Turf Nurseries, Palos Park, Ill., during the recent turf courses at Rutgers University.

There is considerable difference in sod handling, Warren said, depending on who handles the sod between grower and ultimate buyer. Sometimes sod isn't stored properly and deterioration results.

He has noted that some merchants have no provisions for rolling out sod, but move large volumes quickly. These largest and "better organized" dealers plan that any surplus can be used on landscape jobs by their own landscape department or local contractors.

"Vacuum cooling has been a great aid to this type of merchandising, so sod can be kept three or four days in stacks before damage occurs," he said.

Some dealers, he continued, may stock sod for short periods but have no provision for rolling out surplus on pavement or polyethylene sheets.

And there are merchants that stock no sod, but maintain an attractive plot of grass from which orders are taken.

The large volume that goes through the landscape contractor isn't endangered unless unfavorable weather occurs, he said, for the sod generally is planted immediately.

Again, he added, vacuum cooling has been a boon on occasions when

unexpected rain delayed installation for several days.

"A high percentage of this grass is well-planted by competent workmen, Warren believes, "but that small part that is poorly handled is provoking and makes an unfavorable and lasting impression."

Warren has observed these bad practices:

1. Failure to recognize and correct contaminants that exist in the site soil can lead to dissatisfaction. The two most noxious problems are quackgrass and bentgrass. Eliminate these before laying sod.

2. Poor grading resulting in water-holding depressions or a surface too rough for satisfactory mowing creates conditions that are almost impossible to correct after grass is established.

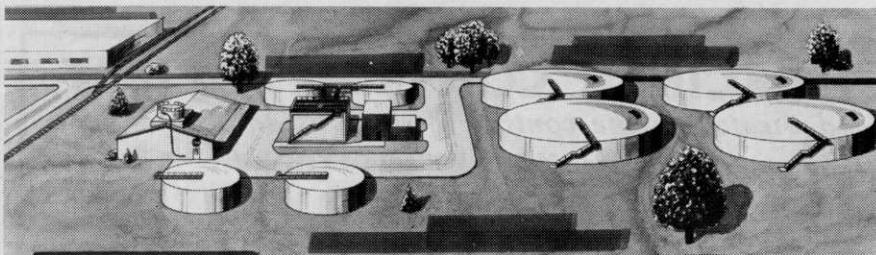
3. A not uncommon problem is the misuse of varieties. The outstanding abuse is the planting of Merion bluegrass in too much shade.

4. Lack of use or misuse of fertilizer is encountered.

5. Careless or ill-advised use of herbicides has caused from minor damage to complete kill.

6. Probably the most frequently encountered abuse of sod is seen in the management of water. This type of mishandling can be briefly described as ranging from too little, too late, too much, and too often.

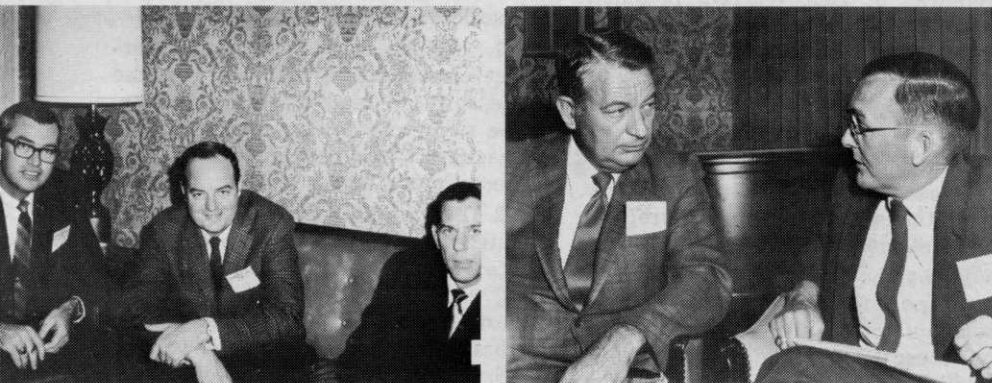
In conclusion, Warren said, "properly advising the new owner in the care of his new grass is often neglected or overlooked. We suggest that written suggestions on the care of grass be placed in the hands of the owner upon completion of every job." (And that seconds the motion, we offered in the February issue about a turf owners' manual.)



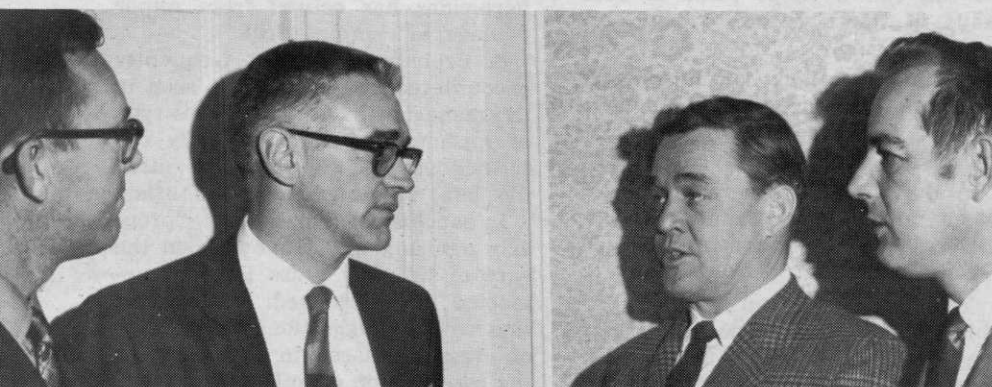
The first phase of a new \$2½ million Chemagro Corporation waste treatment facility is under construction at the company's production plant for environmental control chemicals in the Kansas City, Mo., Northeast Industrial District. Estimated completion date is mid 1970. A staff of six will operate the unit 24 hours a day. The treated water will be purer than the water of the Blue River into which it flows.

Southern Weed Science Society Report:

Look at Weeds As Pest Haven



They may be talking business or just visiting. Chances are the subject is contract applying in the left picture. From the left are Emery McEithen of Amchem, Ambler, Pa.; Frank Cady, contract applicator and owner of Rowco, Inc., San Antonio, Tex.; and John Kirch, also of Amchem. In the right picture are Jay D. Wright, left, Stauffer Chemical Co., Orlando, Fla., and Will Waters, University of Florida, Apoka.



Utility right-of-way maintenance is a good bet for the subject here. From the left are C. E. Walls of Du Pont Company, Columbia, S. C.; Hyland Johns, Asplundh Tree Expert Company, Jenkintown Pa.; L. A. Conn, Du Pont Company, Wilmington, Del.; and Dave Peterson, Stull Chemical Company, San Antonio, Tex.

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MEMBERS of the Southern Weed Science Society—900 strong—held their 23rd annual meeting Jan. 20-21 at Atlanta, Ga. This weed science group continues to stage a program noted for its practical approach to weed control via new technology.

This year, more than 140 papers were delivered. Nine different sections were required to accommodate the many types of weed control under study. These consisted of weed control in agronomic crops, horticultural crops, forests and rangelands, rights-of-way and industrial sites, and aquatic areas. Other sections consisted of the ecological, physiological and edaphic aspects of weed control, teaching and research, developments from industry, and application of herbicides.

Common to this Society's sessions is the great involvement of top commercial company personnel along with researchers.

Dr. William R. Furtick, director of the International Plant Protection Center at Oregon State University, Corvallis, raised some interesting questions regarding the change in weed problems which occurs as the environment changes.

Frequently, he said, we may consider plants to be weeds but their presence may not have any detrimental effect on man's desires and they cannot be considered a weed problem. On the other hand, there is increasing evidence that plants growing in or adjacent to agricultural land, which have been considered unimportant in the past, may have major significance as weed problems in the future.

The plants Furtick referred to are those species that host important insects or disease pests. The study of weeds as intermediate hosts of other pests is perhaps the most neglected area of weed control, he said, particularly in recent years during which modern pest control has received major research attention.

The importance of weed control as a major element of integrated pest control, Furtick stated, has been frequently overlooked. Integrated control involves designing pest control programs that utilize all the control means to the best possible degree.

These would include cultural practices that minimize the potential for the pest or enhance ease of control, such as favoring natural predators, use of highly favored plant species as trap crops at intervals to concentrate insects for destruction without spraying a whole field, and the elimination of weeds that act as the breeding ground where insects or



New officers of the Southern Weed Science Society are, seated, from the left: President-elect—J. N. Orsenigo, Belle Glade Experiment Station, Belle Glade, Fla.; president—D. D. Boatright, Horne-Boatright Chemical Co., Birmingham, Ala.; and vice-president—T. J. Hernandez, Du Pont Company, Houston. Standing: Past president—J. B. Baker, Louisiana State University, Baton Rouge; executive board member—W. L. Lett, Colloidal Products Corporation, Memphis, Tenn.; executive board member—W. D. Hogan, Chevron Chemical Company, Orlando, Fla.; secretary-treasurer—P. W. Santelmann, Oklahoma State University, Stillwater; and editor—A. D. Worsham, North Carolina State University, Raleigh. Also named to the executive board, but not pictured, were James F. Miller, University of Georgia Cooperative Extension Service, Athens, G. A. Buchanan, Auburn University, Auburn, Ala.; and J. S. Baker, Delta Experiment Station, Greenville, Miss.

disease increase and later invade the developing crop.

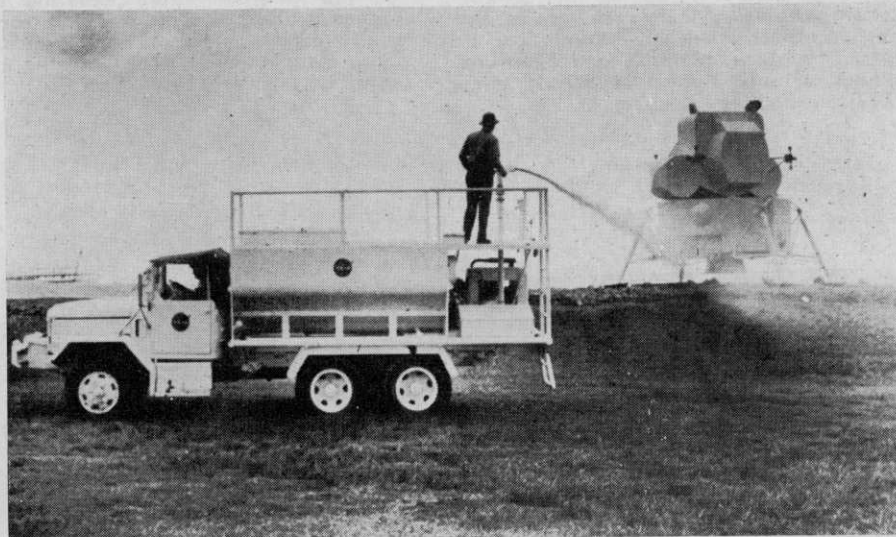
The role of weed control for this purpose, Furtick continued, is almost universally unexplored in relation to most crop pests. What are the weed species that host major insect and disease pests? What distance of weed-free barrier is needed to prevent the spread from weeds to crops of the individual species

involved? These and a host of other similar questions are perhaps some of the most important questions that need answering.

Another example of interdisciplinary failure, Furtick said, has been the concentration on fertilizer introduction around the world with, in many cases, little, if any, thought of the impact on weeds and weed control.

In most areas of the world, there has been a rapid trend toward urbanization. This is often creating decreased labor availability on the farm. The rapidly increasing use of fertilizer is changing the kinds of weeds that dominate the rapidity of their development and their aggressiveness in relation to the crops. Often adequate control requires a substantial increase in weeding labor at a time the supply is dwindling.

This problem has been solved in the United States by rapid introduction and use of pre-emergence and other herbicides and high levels of mechanization. The heavy use of herbicides as a substitute for hand labor and some of the traditional cultivation practices is already giving evidence of causing rapid shifts in the primary species of importance in our fields. This is another good example of dynamic weed ecology. The shift that is occurring is away from the annual species such as *Digitaria*, *Setaria*, *Echinochloa*, *Elusine*, *Amaranthus*, etc., with a take over of the more difficult perennial species such as *Cyperus*, *Sorghum*, *Convolvulus*, and perennial *Panicum*. The problems being created may be much more costly to handle than those originally solved.



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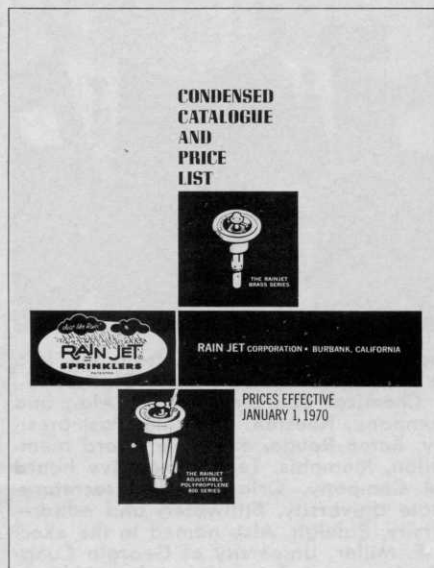
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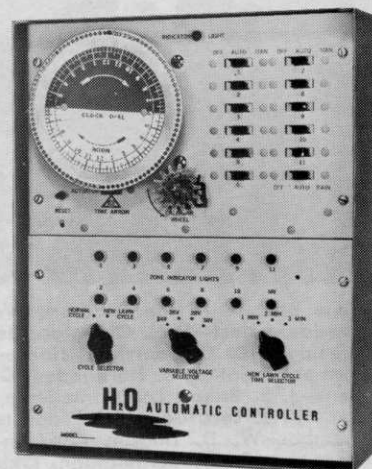
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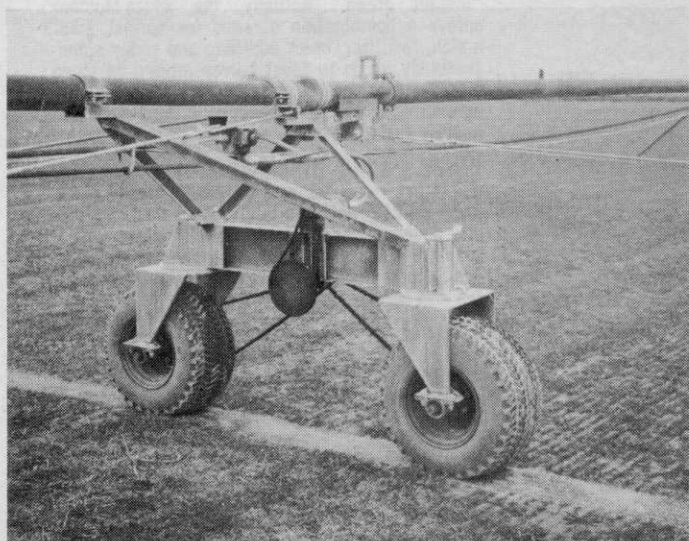
The Leisure Group, Inc., Pasadena, Calif., has added to its Thompson line for 1970 six Rain Pulse impulse sprinklers with coverage up to 80 feet in diameter. Made of die-cast metal for long life, the sprinklers are available on horseshoe bases, spikes or without bases. All have rugged brass heads. Rain Pulse No. 800 (lower left) is fully adjustable to water any portion of a circle. The same head is available in other models on an 8-inch spike, or without any base as a replacement on existing sprinkler or underground systems. Rain Pulse No. 802 (lower right) provides full-circle coverage only. Model No. 820 (upper left) and Model No. 822 (upper right) are shown mounted on the 8-inch spike. In addition to the Thompson sprinklers, The Leisure Group, Inc., manufactures Hayes spray guns, Rain Spray sprinkler systems and Black Magic house plant products. For more details, circle (701) on the reply card.



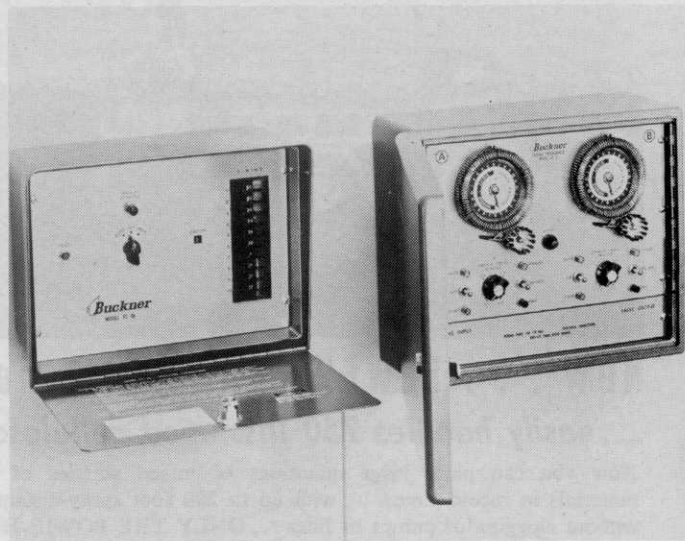
Rain Jet Corporation, Burbank, Calif., is now distributing a new Condensed Catalog and Price List. It gives specifications, engineering data, ordering information and prices on its line of Rain Jet underground sprinkler system materials. The eight-page Catalog and Price List is divided into six sections. Section 1 gives all necessary facts on Rain Jet brass sprinklers with castings. Section 2 covers Rain Jet sprinkler nozzle units without castings, and also shows accessories. Section 3 lists Rain Jet adjustable polypropylene sprinklers with castings. Section 4 groups information on Rain Jet flexible pipe, fittings, valves and sediment separators. Section 5 shows the line of Rain Jet'er portable sprinklers on stands. Section 6 gives general information on terms, freight allowances, and other conditions of sale. For more details, circle (702) on the reply card.



American Granby Co., Milford, Conn., has disclosed deluxe features of its Harvard 700 Series H₂O Irrigation Controllers. A timer dial permits the user to select day or night programming. A re-set button protects system from overload. Normal cycle or new lawn cycle may be dialed by the cycle selector switch. The user may omit half-days or entire days from the watering cycle by programming the calendar wheel. Individual zone switches permit selection of zone to be watered and whether the zone should be watered automatically, manually, or not at all. Individual zone lights indicate zone being watered. A rain switch may be activated to stop controller from watering automatically. Duration of watering can be controlled by the time selector switch. For more details, circle (703) on the reply card.



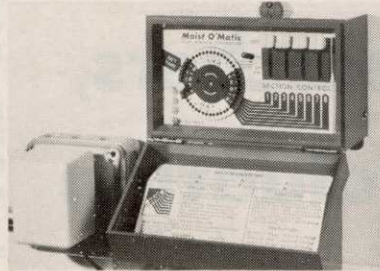
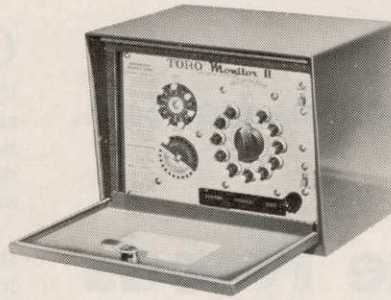
Maxey Manufacturing Co., Fort Collins, Colo., announces a circular central pivot model sprinkler for sod farm acreages. The unit is in use in the Rocky Mountain region. The machine is low to the ground and pivots around a central point, covering 40 to 60 acres, depending on size. It can make a complete circle in 2½ to 3 hours, or be slowed to make a complete circle in 12 hours or longer. For more details, circle (707) on the reply card.



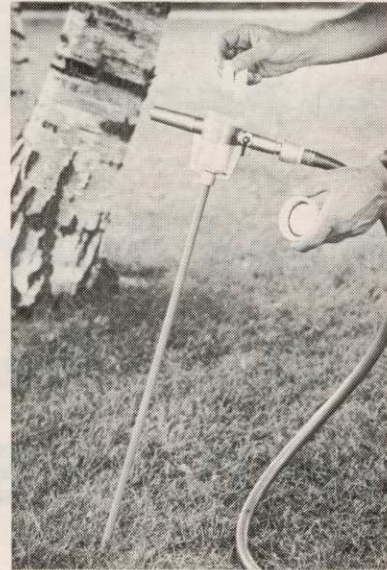
Buckner Sprinkler Co., Fresno, Calif., announces a new central programmer. The Model CP-2, giving complete control of watering from a single location, can be installed for manual, automatic or semi-automatic operation. It has a 14-day programmed irrigation cycle. The unit features independent dual control panels, each capable of operating up to 30 field controllers. Each field controller may have up to 11 sprinkler stations or more. For more details, circle (708) on the reply card.



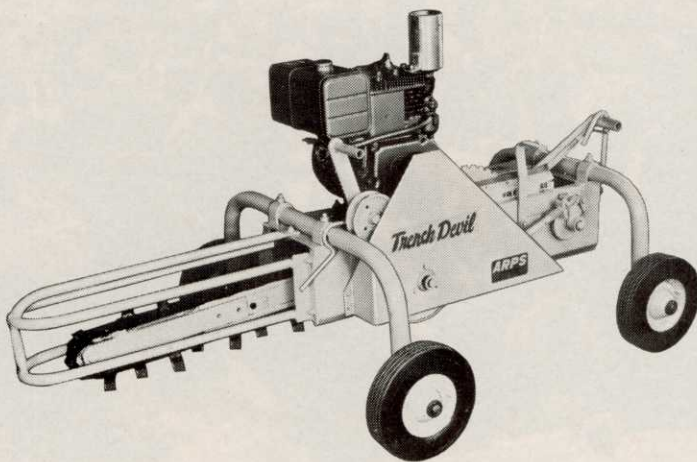
Columbine Products Co., Longmont, Colo., offers a device to tell when and how much to water. Sprink-L-Guide is a small portable soil moisture tester that uses a nine-volt transistor radio battery for power. The complete unit weighs 1½ pounds, including battery. It will measure moisture to 10 inches below the surface. When the probes are pushed into the soil, a small current flows between the probes and is registered instantly on the meter. The more moisture present, the higher the reading. The instrument dial is graduated from one to ten. A needle reading up to six indicates water is needed. The case measures 3¼x6½x2 inches. The unit is \$13.95 postpaid, including battery and instructions. User may return within 10 days for complete refund if dissatisfied. For more details, circle (704) on the reply card.



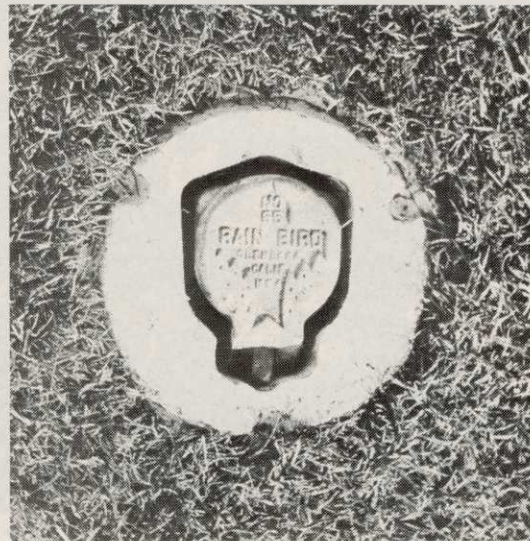
Toro Manufacturing Corporation, Minneapolis, Minn., has announced two new irrigation controllers. Its Monitor II electric controller (above) is designed to handle total residential or industrial landscape irrigation. The new controller features dual control, meaning shrubbery and flower beds can be put on a different watering schedule than the lawn. The Monitor II has a 14-day calendar programmer. Monitor II is available in 11- and 23-station models and features variable time settings from 0-60 minutes for each station. An eight-station electric controller (below) is available for residential and small commercial installations. It has variable timing from 0 to 30 minutes for each station, making possible a complete watering cycle of up to four hours. For more details, circle (705) on the reply card.



Ross Daniels, Inc., West Des Moines, Ia., offers a new model Ross Root Feeder that makes it easier to get plant food, or systemic insecticide cartridges to the roots of trees, roses and shrubs. The larger chamber that holds four or five cartridges at one time, and the fact that refilling the chamber does not require disassembling, enables heavier feeding and faster feeding. Other new features include a double hand grip for easier insertion into the soil; a hand knob for control of water flow; and faster solution of cartridges. The built-in, anti-siphon check valve will be included to prevent any of the solution from possible back-up into the water supply line. The unit, including plant food and insecticide cartridges with complete instruction manual sells for \$9.95. For more details, circle (706) on the reply card.



Arps Corporation, New Holstein, Wis., has added a 6 hp self-contained, portable trencher to its line of Trench Devils. The Model 750 digs trenches for a number of purposes, including sprinkler systems. It digs to a depth of 18-24 inches in widths of 2½-3½ inches. Chain teeth are carbide-tipped. A self-locking boom maintains constant digging depth. Operated by one man. Can be transported in back of station wagon. For more details, circle (709) on reply card.



S. L. Enterprises, Penfield, N.Y., offers a protector for irrigation heads. SAVTRIM heads are safe from mower damage, prevent grass encroachment, have phosphorescent coating for night location. Installed with standard 8" sod cutter. Comes in various sizes, for both fairway heads and tee heads. For more details, circle (710) on the reply card.

New Products Especially for Irrigation

To Pacify 'Naturalists,' WSSA President Says

Weed Science Needs More Researchers, Better Data Evaluation

CURRENT ATTACKS on chemicals are just another outburst in the long and unending war that "naturalists" have waged against technology, believes Glenn G. Klingman, director of plant science, Eli Lilly and Company.

Klingman, outgoing president of the Weed Science Society of America, said in his presidential address that "many of these same people were opposed to fluoridation of public water and to vaccinations."

But do not take their attack lightly, he cautioned, for they are being heard via newspaper, radio, television, and "uncertain government edicts."

The danger that has developed, he said, is that constant reports of this nature are no longer taken seriously.

"Wolf has been cried so often that if a real wolf were to appear, we might pay no attention until it was too late.

"In some manner, we must learn to separate the important problems from those of little or no consequence."

It is good that we have all sorts of scientists and research centers, he continued, "however, the real problem exists in properly interpreting their results, as they relate to the prediction of hazard to humans and to their environment.

There are no real naturalists, contends Klingman. Some claim to want "natural foods" produced by "nature's wisdom" in a "balanced

G. C. Klingman of Eli Lilly & Company, Greenfield, Ind., addresses the 10th annual meeting of the Weed Science Society of America. Klingman has been president the past year. Nearly 600 persons journeyed to blustery and frigid Montreal, Feb. 2-5. Next year's meeting will be Feb. 9-11 in Dallas.



nature" and an environment "free of technology," he said.

Yet they do "unnatural things" such as getting up at seven in the morning, driving a car to work, earning and saving money to buy food that is preserved by cooking or refrigeration.

"They have no interest," charged Klingman, "in returning to a nature balanced by hunger, malnutrition, diseases, insects, vermin and a forbidding and often hostile environment.

"When the naturalist goes to the doctor, he hopes the doctor's technology can shift the balance of nature in his favor."

Klingman admitted there were problems of pollution and scars of technology. But the answer isn't to diminish technology; rather, it is through further application of technology.

Better Training and Evaluation

"My plea is for greater training of scientists, who are capable of undertaking the needed research and of making appropriate interpretations and judgments of relevance to man."

The world-wide detrimental effects of weeds of all kinds are well-documented and recognized, he said. But apparently the need for in-depth and well-rounded weed control education and research is not recognized by our educational system.

"For years, I have not understood, nor do I now understand the lack of enthusiasm for weed science on the part of College of Agriculture administrators," he stated. "There is not a single Weed Science Department at a Land Grant College."

Klingman issued the challenge to his listeners to read the Biblical parable of the talents, Matthew 25:15-30. "Professional talent in weed science has been 'hid in the earth' about long enough," he asserted.

"There is nothing to indicate that the public needs protection from herbicides as they are labeled and used. There is evidence of a positive and unmistakable interest in the proper development and proper use of herbicides as a part of a total weed control program."

Nature's Herbicide

But the naturalists could claim a moral victory as the nearly 600 weed scientists gathered in Montreal, Feb. 2-5. As they discussed weed control problems and achievements from every aspect in the

warmth of the Hotel Queen Elizabeth, undoubtedly the most effective herbicide raged outside—the work of Nature—a blinding blizzard and frigid 15-degree-below-zero temperature.

Nevertheless, WSSA members asked, through resolutions, that scientific data rather than whims of nature or politicians be the basis for making decisions regarding pesticides and herbicides.

Members asked that all levels of government first collect data from government, industry and educational institutions and evaluate it thoroughly before publicly announcing restrictions.

The Secretary of Agriculture was asked to add a weed specialist to his staff for advice on policy-making.

The legislative committee recommended that WSSA establish active liaison with the legislatures of each state.

Officers and Awards

L. L. Danielson, Weed Investigations, Horticultural Crops, Agricultural Research Service, USDA, was elected WSSA president for 1970.

Other officers are: President-elect—D. L. Klingman, Plant Industry Station, Beltsville, Md.; Vice-president—R. P. Upchurch, Monsanto Company, St. Louis; Secretary—Arnold P. Appleby, Department of Farm Crops, Oregon State University; treasurer and business manager—F. W. Slife, Department of Agronomy, University of Illinois; Editor of Weed Science—E. G. Rogers, Department of Agronomy, University of Florida.

Honorary Fellows, a new award this year to recognize outstanding contributions to weed science, were presented to Dr. Warren C. Shaw and Dr. Fred W. Slife. The award for the outstanding paper went to Dr. J. D. Weber of North Carolina State, for his paper, "Adsorption of Triazine Components on Organic soils."

Papers and addresses at this 10th WSSA meeting approached the 200-mark. Most were related to the agricultural crop field, but a significant portion dealt with non-crop vegetation, principally rights-of-way maintenance and aquatic weed control. Sketches of some papers follow, while others will be presented in greater detail in later issues.

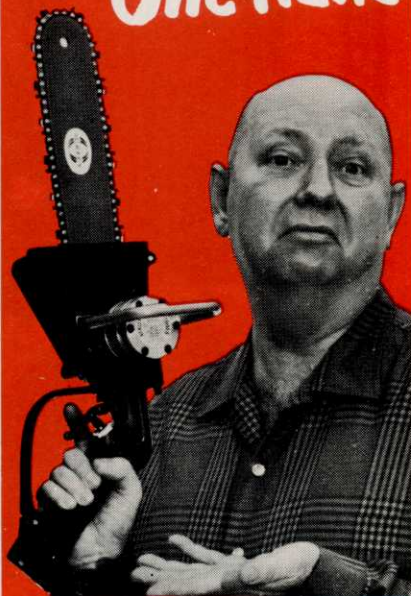
Aquatic Herbicide Data Lags

Industry is running the risk of losing these herbicides for aquatic use, warned Charles R. Walker of the Interior Department's fisheries



Close to 200 papers and addresses were delivered, with news releases available on many of them. F. A. Holmes, right, chairman of the public relations committee, and Leavitt S. White, both of the Du Pont Company, mark a program to indicate which sessions are covered by advance releases. Several presentations were reproduced by a duplicating machine in the press room.

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division. And he named:

Ammate, Copper Sulfate, Dichlone, 2,4-D, Diuron, Monuron, Petroleum Solvents, Silvex, Sodium Arsonite, 2,4,5-T and Xylene.

He named these compounds because no requests had been received from manufacturers asking for an extension of use until research data are complete enough to serve as a basis for establishing new tolerances.

"Industry has had fair warning that these registrations would expire," said Walker. Yearly extensions have been required since 1967. In the absence of extension requests for the current year, a notice of cancellation "could come at any time." Automatic cancellation will come effective Dec. 31, 1970.

It is imperative that industry get its data filed with the appropriate federal agencies, stressed Walker.

"The privilege of using a chemical is going to become indeed a privilege. These materials are going to be scrutinized much more closely."

While proponents of the major approaches to aquatic weed control—mechanical, chemical, biological, physiological and combinations, thereof—stated their case, the consensus seemed to develop that the total water management concept shows most promise. These thoughts developed as to what needs to be learned or tried:

—The target problem must be pinpointed then dealt with. One plant might retard the growth of another. Eliminate it and a worse problem could develop. Or an acceptable plant might be encouraged to compete with an undesirable species.

—Generally, more needs to be known about the genetics of aquatic plants.

—Better materials are needed, ones developed specifically for aquatic weed control, to replace the "dressed over" agricultural crop chemicals.

—Research is needed to discover how to control nutrient intake. Or perhaps techniques can be employed to tie up basic nutrients, such as phosphorus. Because the absence of trace elements can drastically affect plant growth, this avenue should be explored.

—Harvested aquatic plants perhaps could be utilized as feed, or in some manner to offset the cost of this weed control method.

Pellets, Beetles and Beans

Imagination already has worked overtime in searching for new directions in aquatic weed control. Reports covered efforts with herba-



Mrs. Ivy Wile would be delighted to chat with you—about the "Ecology of Vascular Aquatic Plants in Small Lakes and Ponds in Southern Ontario." That's the name of the paper she presented at the WSSA aquatics division. She works for Ontario's Water Resources Commission and Department of Lands and Forests.

ceous fish and insects, herbicide-impregnated plastic pellets and laser beams. Here are some findings:

—2,4-D impregnated polyvinyl chloride pellets (2,4-D n-butyl ester) was tried as a control of Eurasian Watermilfoil. Laboratory tests indicate that the controlled-release method of dispersing herbicides was effective at low dose rates. Dosages as low as 3 ppm, based on 100% immediate release, produced toxic effects in 48 hours. All test plants were dead within two weeks. M. A. Lawson, U. S. Army, Edgewood Arsenal, Md.

—Helicopter applications of granular 2,4-D at 20 lbs./acre were effective in killing milfoil in Currituck Sound. W. E. Chappell, Aerial Enterprises, Inc., Roanoke, Va.

—Larvae of the moth *Parapoynx stratiotata* (L) feeds on the submerged foliage of milfoil while the curculionid beetle *L. todactylus leucogaster* attacks the emergence stems and flower buds. In an aquarium situation, larvae of the moth were able to destroy all exposed plants. R. I. Sailer, ARS, USDA, Beltsville, Maryland.

—Use of the laser beam has produced "delayed kill" in laboratory tests. The beam sears the leaf tissue, apparently disrupting photosynthesis. Plant growth stops, and in about five to six weeks exposed plants die.

"Natural Look" Right-of-Way

Public pressure has brought on the "natural look" trend in right-of-way maintenance. The clearing practice is changing from the straight swath to that of removing only vegetation which could interfere with lines, reported Hyland



WSSA officers for 1970 are, right to left: President—L. L. Danielson, Weed Investigations, Horticultural Crops, USDA's Agricultural Research Service, Beltsville, Md.; president-elect—D. L. Klingman, Plant Industry Station, Beltsville; vice-president—R. P. Upchurch, Monsanto Company, St. Louis; secretary—Arnold P. Appleby, Department of Farm Crops, Oregon State University, Corvallis; treasurer and business manager—F. W. Slife, Department of Agronomy, University of Illinois, Urbana; editor of Weed Science—E. G. Rogers, Department of Agronomy, University of Florida, Gainesville; and past president—G. C. Klingman, Eli Lilly & Company, Greenfield, Ind.

Johns, Asplundh Tree Expert Company. Trees are left in low areas where enough clearance exists. Access roads are being built diagonal to highways.

In some instances, as many as 30 to 50 trees have been planted to screen the right-of-way from the highway, said J. B. Middleton of

Pennsylvania Electric Company.

To Please the Public

Anything—within reason—to please the public is the goal. And W. D. Dittman of Appalachian Power Company, Roanoke, Va., had some prescriptions for dealing with people.

Obviously, people are becoming collectively concerned, judging from the number of bills at all levels of government, he said.

Tell people what materials you are using and what effect they will have on the environment, he advised.

"We put a lawyer on our staff, then sent him to Amchem to become familiar with the legal aspects of herbicides.

"We have a veterinarian on a retainer basis. We sent him to Dow Chemical. When a complaint comes in, he can tell the farmer what's really wrong, rather than 'We didn't do it.' On occasion, the farmer gets his livestock examined at our expense.

"We support research with money, not lip service."

Dittman added that it was highly important to react to every complaint. "Big problems often come from minor accidents."

He hopes the next step will be to get a doctor specially trained to answer people's concern about herbicidal effect on human health.

Just finding a way to neutralize herbicide odors would be a big help, said Dittman.

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roll after roll slab after slab day after day

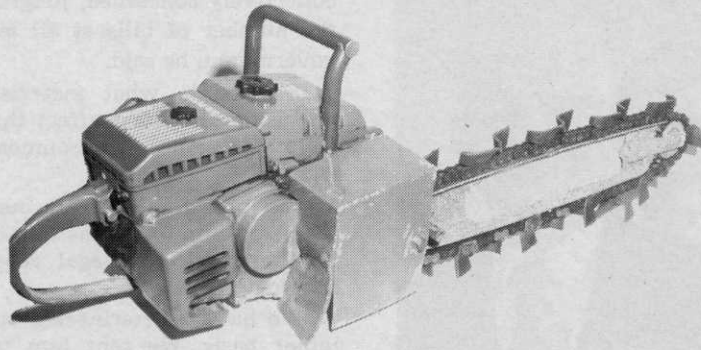
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Nurseryman Digs Trench With Power Saw

Dig a 30-ft. ditch in 60 seconds? Bernard Wherry claims he can do it with his saw. Actually, it's a Homelite chain saw — modified.

Wherry had been working on a chain-driven trenching tool for 3½ years. He needed one for fast digging around trees and shrubs. He's owner of Wherry Nurseries, St. Marys, W. Va.

His idea took practical shape when he modified an XP-1130 Homelite head. Instead of saw teeth, the chain mechanism contains a series of canted cutting heads. It will cut a ditch from two to six inches wide and 2½ feet deep, says Wherry.

"It's geared down and will last for ages," he said. "Works any-

where, any position, by simply guiding it with one hand. Digs around 2,000 feet of ditch per 1½ pints of gasoline.

"We even use it for draining swamps, water holes and digging fence post holes."

Considering that the base unit was made by Homelite, a division of Textron, Wherry figured the company would be interested. It was. Thomas Hunter, new products manager, and Bill Boracheck, project engineer, visited Wherry. Hunter tried the saw . . . uh . . . trencher. He claims a 10-foot ditch in 28 seconds.

Production plans aren't completely worked out yet, but if you want more information, circle (711) on the reply card. No doubt, sample lots will be undertaken before full production begins. But Homelite knows it has at least 100 units sold. Wherry wants 'em.

Midwest Sod Growers Set Soil and Seed Specifications

With the introduction of specifications for soil preparation and sodding, the Midwest Turfgrass Growers Association has reported that an increasing number of landscapers, architects and builders are meeting with sod producers to discuss turfgrass and sodding.

The Midwest group shared experiences at its annual meeting recently

in Lincoln, Neb.

Members also discussed a committee study and recommendation for turfgrowers' seed specifications. A resolution was passed that declared Association members would use only seed that met the specifications. These specifications are being published and will be distributed to members.

Growers discussed the possibility of the Midwest group becoming affiliated with the American Sod Producers Association and of indi-

vidual state associations becoming a part of the Midwest group.

Joe McDermott, Loveland Lawns, Omaha, Neb., was re-elected president; Ed Keeven, Emerald View Sod Farms, Inc., O'Fallon, Mo., as vice-president; and William Latta, Latta-Scholes, Inc., Kansas City, as secretary-treasurer.

New board members elected to two-year terms are: Jack Meyers, Stilwell, Kan.; Bruce Huffaker, Hastings, Neb.; and Duane Thompson, Arlington, Neb.

Insect Report

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



TURF INSECTS FIRE ANT

(*Solenopsis geminata*)

TEXAS: Heavy along highway roadside near Clay in Burleson County and south of Navatota in Grimes County, also near College Station in Brazos County.

A HARVESTER ANT (*Pogonomyrmex californicus*)

UTAH: Collected at St. George, Washington County. This is a new county record.

INSECTS OF ORNAMENTALS

A SOFT SCALE

(*Ceroplastes ceriferus*)

FLORIDA: Adults infested stems of 10% of 11,300 plants of *Podocarpus* sp. in nursery at Lake Monroe, Seminole County.

TREE INSECTS

PINE NEEDLE SCALE

(*Phenacaspis pinifoliae*)

CALIFORNIA: Eggs and adults heavy on Monterey pine at Yuba City, Sutter County.

OYSTERSHELL SCALE

(*Lepidosaphes ulmi*)

CALIFORNIA: Heavy on maple tree nursery stock at San Jose, Santa Clara County.

TWIG GIRDLER

(*Oncideres* sp.)

TEXAS: Heavy damage on oaks 3 to 8 feet tall in Sam Houston National Forest in Montgomery County.

A CLEARWING MOTH

(*Paranthrene robiniae*)

CALIFORNIA: Larvae medium on cottonwoods at Solvang, Santa Barbara County.

OBSCURE SCALE

(*Melanaspis obscura*)

ALABAMA: Medium to heavy on many oaks along streets and walks at Auburn, Lee County. Many small to larger lower limbs dead; others weakened.



Dr. Lyle W. Weldon

Aquatic Weed Researcher Dr. Lyle Weldon Drowns

Dr. Lyle Weldon, 35, one of the nation's foremost aquatic weed researchers, is dead as the result of accidental drowning.

Dr. Weldon died Feb. 1 while scuba diving in Lake Susannah on the Naval Training Base at Orlando, Fla. He was trying to find suitable sites to conduct submersed weed research, reported Robert D. Blackburn, of USDA's Agricultural Research Service.

Dr. Weldon was a certified and experienced diver, Blackburn said. The cause of the accident just isn't known.

He had been diving alone, but had a friend, Art Barrett, waiting on shore. He surfaced and called for help; but by the time Barrett was able to get a boat and reach him, it was too late.

Professional divers have retraced his diving pattern, Blackburn said, but have been unable to determine the cause of drowning.

Dr. Weldon had published some 90 articles, several of them authored with Blackburn. A number of his articles have been published in

WEEDS TREES and TURF. The most recent three, co-authored with Blackburn, were on new methods for combating aquatic weeds, October, 1967; Eurasian Watermilfoil, November, 1967; and a report on controlling Hydrilla Verticillata, October, 1969.

Weldon, native of Oregon, had worked for USDA since 1956. He transferred to Fort Lauderdale in 1960 to work in aquatic weeds. He earned a bachelor's degree in farm crops from Oregon State University in 1955; a master's degree in agronomy with minor in botany from the University of Wyoming in 1956, and his doctorate in agronomy with minor in plant physiology and statistics also from Wyoming in 1959. He took additional graduate work at North Carolina State College and at Oak Ridge Institute of Nuclear Studies.

Weldon was active in several regional and national associations of weed scientists. He had acted as an aquatic weed control consultant to the governor of the Panama Canal Zone and to Suriname Aluminum Co., on aquatic weed problems in South America.

He is survived by his wife, Shirley; two daughters, Kara Lee, 12, and Katherine, 10; and one son, Lyle William Jr., 7.

A-C Announces Expansion

Henry Corporation, subsidiary of Allis-Chalmers, announces it will double production capacity of its Topeka, Kan., plant with an \$800,000 expansion.

Topeka is headquarters for AC's industrial tractor and equipment division. Henry Corp. produces attachments, including backhoes, loaders, fork lifts, and logging equipment for the division's line of industrial tractors.



L-25, L-40, L-60

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National Lawn And Garden Week: March, April, May

National Lawn and Garden Week really was a week in 1969. In 1970, it's three months.

Maybe the decision for the longer period came about because of the theme, "Growing With America." After all, not much growing can be accomplished in a week.

So this year's observance has been broadened to include the spring months of March, April and May. The initial observance is in Washington, D.C., Mar. 20, the first day of spring.

March is "Plan to Grow Month;" April, "Plant for Proper Growth;" and May, "Pick a Growing Project."

The objective of the national observance is to bring improvement in the appearance of homes, neighborhoods, business districts, and entire communities through the proper planting and maintenance of lawns, shrubs, flowers and trees — year around.

Hopefully, people who take an



interest in beautifying things, will hardly be content with blight and ugliness elsewhere. Their efforts could bring changes and demands to preserve and purify other aspects of human environment, in the heart of big cities as well as in suburbs and small towns.

Co-chairman for the 1970 observance are W. Atlee Burpee III, Philadelphia, and Harold R. Lewis, director of information, USDA.

ALCA Announces '70 Officers: Warren Purdy Is President

Warren F. Purdy of San Diego, president of Purdy & Associates, is the new president of the Associated Landscape Contractors of America. He was named to succeed Thomas O. Lied of Milwaukee at ALCA's eighth annual meeting recently in Orlando, Fla.

Other officers are: President-elect—Wallace A. Gunderson, president of a landscaping contracting firm bearing his name, Rapid City, S. D.; vice-presidents—Norman A. Gray, president of Transit Seeding, Inc., Mansfield, Mass., and Ralph Pinkus, president of North Haven Gardens, Inc., Dallas, Tex.; secretary—Jerry J. Lankenau, vice-president of Lankenau-Damgaard and Associates, Plymouth, Mich.; and treasurer—William A. Rae, president of Frost and Higgins, Burlington, Mass.

Pacific Toro Schedules Field Days in March

A series of field days to demonstrate Toro mowers and tractors, Ryan turf products, Moist O'Matic irrigation equipment, and Allied Turf products are set for March in California.

Hugh G. McKay, sales manager of the turf products division of Pacific Toro Company, Gardena, announces these dates and locations:

Mar. 17—Vacation Village, San Diego; Mar. 18—La Palma Park, Anaheim; Mar. 19—Montebello Country Club; Mar. 24—Encino Community Building; Mar. 25—MacKenzie Park, Santa Barbara; and Mar. 27—Cal Poly College, San Luis Obispo.

R. W. Ickes Elected President Of Aerial Application Corp.

Raymond W. Ickes, son of Harold L. Ickes, the Secretary of the Interior under Presidents Roosevelt and Truman, has been elected president and a director of Aerial Application Corporation, the nation's largest agricultural aviation company engaged in insect and weed control, fertilizing and seeding. The firm also has plans well advanced to move into the fire fighting and forest fertilization fields in the near future.

The announcement was made by Stuart M. Speiser of New York, board chairman of the company which will have its principal executive and operating offices in the Russ Building, 235 Montgomery Street, San Francisco.

Ickes, who will make his headquarters at the Russ Building office, has been active in San Francisco business affairs for more than 20 years, having served successively as

vice-president and general counsel of American Independent Oil Company; vice-president and director, Natomas Company; and more recently as president and director of Pacific Far East Line, Inc., and then of American President Lines, Ltd.



Thomas P. Caldwell, III, of Apopka, and Michael T. Ayer, of Ocala, center left to right, University of Florida students majoring in ornamental horticulture, Turf-Grass scholarship winners, display their awards as Dr. G. C. Horn, left, professor of Ornamental Horticulture, and Dr. Charles B. Browning, Dean of the College of Agriculture, University of Florida, look on. Caldwell received the Miami Beach Host Committee National Parks and Recreation Association Scholarship, and Ayer was awarded the Col. Frank Ward Scholarship. Both scholarships were presented by the Florida Turf-Grass Association.



"Were you the gentleman who called about having a dead tree remov . . ."

Landscaper, Applicator Firms Merge in Tulsa, Okla.

Carl R. Miller, president of T. Landscapers, Inc., Tulsa, Okla., has announced a merger with The Pied Pipers, Inc., also of Tulsa.

"With this merger, The Landscapers now offers the most complete landscaping service in the Southwest," Miller said.

Miller's company specializes in the design and creation of landscaping for both commercial and residential applications. It engineers and installs lawn sprinkler systems and establishes lawns from the company's own 10-acre turf nursery.

Pied Pipers, Inc., owned by Harold D. Stephens, specializes in chemical application to lawns, plants and trees for weed and pest control, fertilization and feeding, and industrial weed control.

Niagara Chemical Forms Industrial Sales Department

FMC Corporation's Niagara Chemical Division has organized a new marketing group to sell its proprietary chemicals in non-agricultural use areas. Called the Industrial Sales Department, it will be headed by Frank K. Chestnut, a 22-year employee and most recently manager of advertising and public relations.

Among the products the new department will be assuming sales responsibilities for are Tandex^(R) soil sterilant, recently introduced for broad spectrum non-crop weed and brush control; Pyrenone^(R) synergized pyrethrins, used in an estimated 85% of all household insecticidal aerosols and space sprays; and Drione^(R) insecticide, an unusually effective control for roaches, ants, spiders, and many other insects.

\$600,000 Grant Awarded For Pesticide Research

A joint project by four of the world's foremost centers for basic research on insecticides may open the way to development of practical new pesticides that will minimize environmental pollution.

Scientists at the centers officially began work in January on a project, the first cooperative venture of its kind, that is being supported for its initial three years by a \$600,000 Rockefeller Foundation grant.

Most of the grant money will go toward traineeships in pesticide research and support for the promising young scientists who receive them.

The four laboratories collaborating on the project are at the University of California, Riverside, UC Berkeley, Cornell University of Illinois.

Each of the laboratories has made major contributions to the field of chemical pest control and will pursue its own special area of research during the project.

UCR's major research efforts will focus on the synthesis of novel, selectively toxic candidate compounds and on resistance development by pests to pesticides.

Heading UCR's part in the project is Dr. T. R. Fukuto. He'll personally be in charge of the work aimed at developing new candidate insecticide materials. Dr. Robert B. March will direct research on the development of resistance to toxic chemicals by insects. Both have played significant roles in past research at UCR that has led to the development of many insecticides in use today.

A former colleague of theirs at UCR, Dr. R. L. Metcalf, will head the project work at the University of Illinois. Dr. J. E. Casida will lead the project work at UC Berkeley and Drs. C. F. Wilkinson and R. D. O'Brien at Cornell University.

The project leaders are hopeful that their research findings will lead to development of insecticides with new modes of action, greatly enhanced selectivity, improved biodegradability, and more desirable persistence characteristics.

"Unfortunately," Dr. Fukuto said, "persistent pesticide chemicals in use today are, in some cases, the most effective or only practical and available means of controlling certain pests. Other materials are not as satisfactory in all cases.

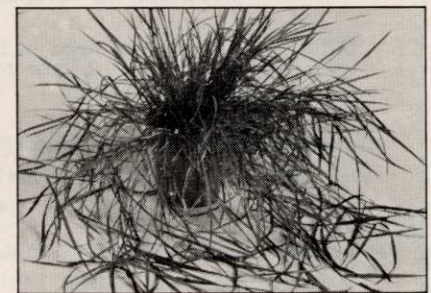
"We need to develop practical substitutes for the objectionable chemicals now in use and to study alternative means of pest control."

At last! A non-creeping Bentgrass that's easy to care for. **HOLFIOR** Colonial Bentgrass

CONSIDER THESE ADVANTAGES: It is non-creeping in contrast to the creeping bentgrasses. Its stems and leaves produce a dense turf with good texture. The tillers stand more upright with leaves which remain green all the way down to the ground. Avoid tufty appearance even when mowed short. Provides a uniform turf without ugly patching or puffiness.



Note the non-creeping growth characteristics of the Holfior Bentgrass above compared to the Penncross Bent below.



Want more information? Write for Northrup King Turf Bulletin #3 on Holfior Bentgrass.



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Incriminating 2,4,5-T Test Is Invalid

Birth deformities in laboratory mice exposed to high dosages of 2,4,5-T may really have been caused by a toxic contaminator. The possibility is being investigated by the U.S. Department of Agriculture.

The same substance may be contaminating other chemicals, so USDA is reviewing or gathering new data for 17 other herbicides, fungicides and insecticides. All 17 compounds are polychlorophenolic pesticides.

Ned D. Bayley, director of Science and Education, said the inquiry was initiated after new data submitted to the Department of Health, Education, and Welfare, indicated that the 2,4,5-T used in the study conducted by Bionetics Research Laboratories for HEW contained 27 parts per million of tetrachlorodibenzopara-dioxin, compared with only about 1 ppm of this contaminator generally found in the herbicide.

New data show that preliminary tests of 2,4,5-T with 1 ppm of this contaminator give no indication of birth deformities, Bayley told Rep. Richard McCarthy of New York.

It was the Bionetics study of 2,4,5-T, along with other pesticides, cited last October when USDA announced it would cancel registration



Newly elected Board of Directors of the National Landscape Nurserymen's Association are, from the left: (seated) Vice-President William R. Heard, Heard Gardens, Des Moines, Ia.; President Arthur W. Landseadel, The Secor Landscape Center, Toledo, Ohio; Secretary-Treasurer James A. McCarty, Colonial Garden Center, Inc., Evansville, Ind.; (standing) Herman R. Wallitsch, Director Region II, Herman R. Wallitsch Nurseries, Louisville, Ky.; Joe L. Strickfaden, Director Region III, Strickfaden Nursery, Sandusky, Ohio; Michael Ryan, Director Region IV, Old Orchard Gardens, Manchester, Mo.; Member-at-Large James Maschmeyer, Maschmeyer's Nursery, Inc., Indianapolis, Ind.; Richard Kauffman, Director Region I, J. Franklin Styer Nurseries, Inc., Concordville, Pa.; Arthur Fitzsimmons, Director Region VII, Arthur Fitzsimmons Garden Centre, Hamilton, Ontario, Canada, and Edward Teas, Director Region V, Teas Nursery Co., Inc., Bellaire, Tex. Not shown is Director of Region VI, Frank M. Tomlinson, Tomlinson's Select Nurseries, Whittier, Calif.

of this herbicide for use on food crops effective Jan. 1, 1970, unless FDA, the Food and Drug Administration, HEW, had established a safe legal tolerance for such use.

"We are awaiting advice from HEW as to whether it intends to establish tolerances for 2,4,5-T before we decide whether to cancel or extend uses of 2,4,5-T on food crops," the letter said. "Our Jan. 1, 1970, date was based on HEW's expectation that it would have reached a decision by that time. That agency

believes the public interest would best be served by waiting for additional research data which will be available shortly. We concur in the judgment."

EDITOR'S NOTE: As WTT went to press, it was further learned that the solvent, DMSO, also was used in the Bionetics test. This material has been known to cause cancerous tumors. DMSO is not used as the solvent for commercial applications of 2,4,5-T.

Meeting Dates

Dates for this column need to reach the editor's desk by the 10th of the month preceding the date of publication.

Southern Chapter, International Shade Tree Conference, Hampshire Motor Inn, 7411 New Hampshire Ave., Langley Park, Md. Mar. 1-4.

University of Massachusetts Annual Fine Turf Conference at Highpoint Motor Inn in Chicopee, Mass., Mar. 4-6.

36th Annual Turfgrass Conference, Iowa Golf Course Superintendents Association, Roosevelt Motor Hotel, Cedar Rapids, Mar. 9-11.

North Carolina State University Turfgrass Conference, Faculty Club at NCSU, Mar. 10-11.

Western Society of Weed Science annual meeting, Sacramento Inn, Sacramento, Calif., Mar. 17-19.

University of Maine Mid-Winter Turf Conference, Steer Inn Motor Lodge, Rte. 1, Maine Turnpike Exit No. 7, South Portland, Me., Mar. 18-19.

California Park and Recreation Society announces three regional workshops. Apr. 7 at Palo Alto Community Center on Middlefield Road; Apr. 8 at Carriage House Restaurant, 1210 N. Blackstone Ave., Fresno; and Apr. 9 Parnell Park Activity Building, Whittier.

Ohio Chapter, International Shade Tree Conference, at the USDA Shade Tree and Ornamental Plants Laboratory at Delaware, Ohio, July 8.

46th International Shade Tree Conference, Hotel Flagship-Rochester, Rochester, N.Y., Aug. 9-14.



USDA Registers U. S. Borax Herbicide, Maintain CF 125

United States Borax & Chemical Corporation announces the registration of MAINTAIN CF 125 by the U. S. Department of Agriculture.

MAINTAIN CF 125 has proved to effectively retard many grasses and control broadleaved weeds and vines. MAINTAIN CF 125 acts systemically and is translocated from the leaves and/or the roots throughout the plant to meristematic tissues.

The chief ingredient of MAINTAIN CF 125, chlorflurenol, is a product of E. Merck AG, Darmstadt, West Germany.

Extensive field and laboratory testing has been under way over the past three years by the U. S. Borax.

"Results have established that MAINTAIN CF 125 is the first new material which will economically and effectively control most turf grasses and further give season-long control of broadleaved weeds associated with turf," stated Dr. L. M. Stahler, manager of agricultural research and development.

Principal markets for MAINTAIN CF 125 include highways, golf



Robert Hector, right, chairman of the board of Hector Supply Company, with Tom Tabor, sales representative for Zonalite Division of W. R. Grace, stands before the Terra-Lite and Vermiculite display at the first annual Hector Turf & Garden Trade Exhibit and open house at the firm's new million-dollar warehouse in Miami. More than 25 manufacturers exhibited at the trade show, Jan. 15-18.

courses, parks, airports, utilities, railroads, and military installations.

Iowa Aerial Applicators Elect Theobald President

Lester Theobald of Mapleton has been elected president of the Iowa Aerial Applicators Association. His selection came at the annual business meeting recently in Des Moines.

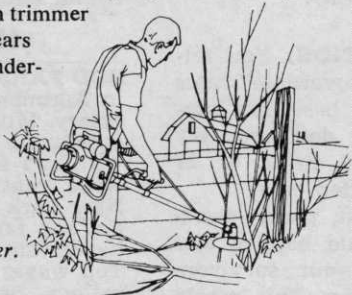
Other officers and committee chairmen are: Vice-president—Don

Chase of Villisca; secretary-treasurer—Lowell Weir of Boone; public relations chairman—Vernon Orr of Whiting (members are Leo Sterk, O. B. Cox and Ray Breazeale); program chairman—Elmer Steier of Whittemore (members are Cecil Schenk and Paul Hursh); and safety chairman—Marvin Smith of Eldora.

Members selected past president Paul Hursh as the Iowa group's director member to the National Aerial Applicators Association.

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Rugged BRUSHKING cuts down saplings and trees up to nine inches diameter; with trimmer attachment, effectively clears weeds, heavy grass and underbrush. No need for toxic chemicals. Safe and easy to operate. Thousands in use the world over. Five models to choose from. Send for free literature and name of nearest dealer.



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Trimmings

THE POPULAR WAY to start the ball rolling toward banning a chemical these days apparently is to feed ridiculously high amounts to laboratory animals until they develop some scary ill effects.

Reader's Digest reports that it took cyclamate amounts equivalent to 10 times the established daily intake limit for humans to kill the fetus in mice; 15 to 30 times the recommended human limit to cause tissue changes in rats; and levels "well above the recommended human maximum" to affect rabbits.

But cyclamates fell.

Of course, DDT got the ax even without this kind of research basis. A study of Arizona aerial applicators showed a build up of DDT five times greater than the national average, without detectable ill effects. Twenty-year employees in a DDT factory showed no detectable ill effects. Just recently, Michigan State researchers tried to prove conclusively a correlation between DDT content and death of Coho Salmon fry. They couldn't.

Apparently this type of research doesn't count.

Now 2,4,5-T is under fire because a laboratory test indicated the herbicide caused cancer in mice. It develops that the 2,4,5-T used contained a contaminate in amounts 27 times greater than can be expected normally. Yet insiders predict the herbicide will be restricted.

* * *

SUPPOSE WE APPLY the same test criteria and reasoning, based on experimentation results, to another pesticide problem?

We suggest the writers of all inaccurate information about pesticides eat the paper their words are printed on. At the least, this action could cause severe stomach cramps; at the most, a weight problem and increased danger of heart attack; or the real possibility of a fatal choking spell.

Now there's solid basis for banning the writing of that kind of material, wouldn't you say?

* * *

ANOTHER QUESTION: You fellows who use those "overdose" rates on small animals as basis for banning pesticides, why don't you try taking aspirin at 10 times or 27 times the recommended rate?

(On second thought, please don't. We know what would happen and we couldn't stand your survivors calling for a new ban. This whole pesticide controversy gives us a headache, and we need our aspirin.)

Classifieds

When answering ads where box number only is given, please address as follows: Box number, c/o Weeds Trees and Turf, 9800 Detroit Ave., Cleveland, Ohio 44102.

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.

USED EQUIPMENT

FOR SALE — Hardie hydraulic spray 60 to 80 gallons per minute pump (2) two hundred and fifty gallon tanks mounted on 1962 two ton Chevrolet truck, two-speed axle, driven less than 59,000 miles. Excellent condition, will sacrifice due to bankruptcy, \$2,000.00 cash and carry. F. C. Thomas Tree Service, 1818 Grove Street, Greensboro, North Carolina 27403.

MIST BLOWERS, Hardie L-80A Aero-mist. 14,000 C.F.M., 150 M.P.H., Ford Industrial 4 cylinder. Completely reconditioned, \$1,250.00 each. Equipment Sales Company, 4744 Sunrise Highway, Massapequa Park, N.Y. 11762. Phone 516 799-7619.

SPRAYERS, chippers, log splitters and other equipment at large savings. Let us know your needs. Equipment Sales Company, 4744 Sunrise Highway, Massapequa Park, N. Y. 11762.

TORO 76" Professional lawn mower. Used 200 hours. \$695. Phone (714) 537-5715 Orange County, California.

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ESTABLISHED tree service, Orange County California; Equipment includes 50' Hi Ranger with Chipbox, Asplundh chipper, Stump grinder, misc. tools. Bad health dictates sale. Paulson Tree Service, 12242 Cliffwood, Garden Grove, Calif. 92640. Phone 714 638-7234.

A FORT Lauderdale Lawn and Ornamental Pest Control Co. 700 yearly contracts. \$70,000 gross. \$20,000 plus net. Employees will stay. Write Mr. DuBois-Anaconda Realty Co., 1776 E. Sunrise, Fort Lauderdale, Fla. 33304.

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SOD FARM MANAGER — A degree in Agronomy preferred but not necessary. Must be able to handle men, coordinate all work and be familiar with sod farm operation; including weed control, grasses, etc. One of New York State's oldest, most modern sod farms, complete with latest harvesting and irrigation equipment. Top wages paid, hospitalization, vacations, benefits, etc. Only experienced, qualified men need apply. Reply giving complete resume including past experience and refer-

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ences. Batavia Turf Farms, Inc., Box 662, Batavia, New York 14020.

LANDSCAPE ARCHITECT — Degree in Landscape Architecture from accredited school with some experience. Salary open. Responsible for design plans, construction coordination, and long range planning of rapidly growing park system. Contact: Karl Holzwarth, Park Director, Racine County Highway and Park Commission, Rte. 1, Box 226A, Sturtevant, Wis. 53177.

EXCELLENT opportunity for experienced Landscape Foreman to supervise landscape crew in execution of planting from plans and sketches. Salary plus incentive pay, hospitalization, profit sharing, insurance and retirement plan. Reply to: The Siebenthaler Co., 3001 Catalpa Drive, Dayton, Ohio 45405.

TWO spray men needed, Boise, Idaho area. Must have adequate knowledge of pesticides as well as being able to contact new accounts. Contact Idaho Pest Control, 100 N. Beach, Boise, Idaho 83704.

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maintenance. Must be quality conscious and willing to work hard. Good pay and excellent future. Cut 'N Care, Inc., 2615 DeLeon St., Tampa, Fla. 33609. Attn. Mr. E. Berthe.

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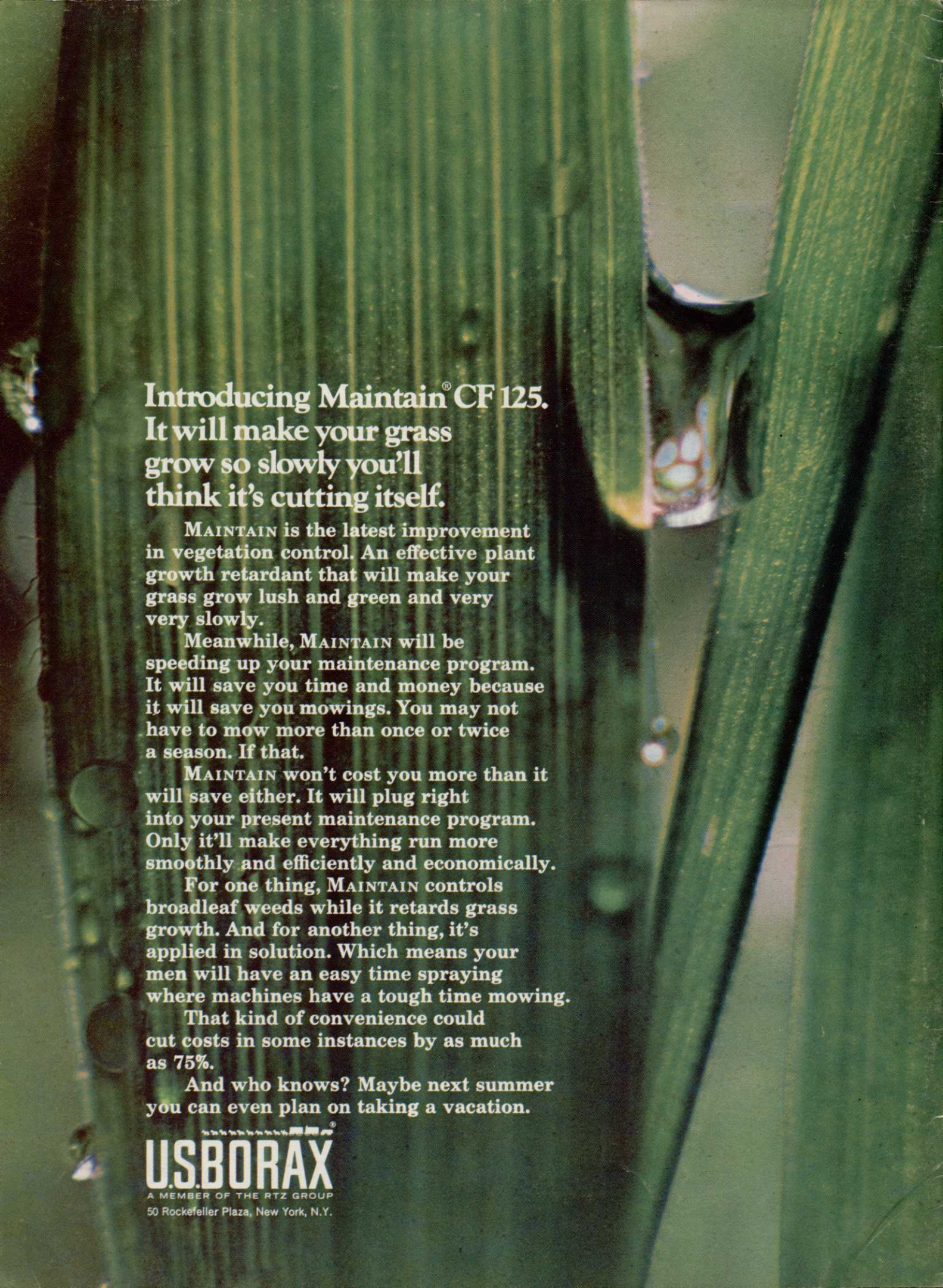
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