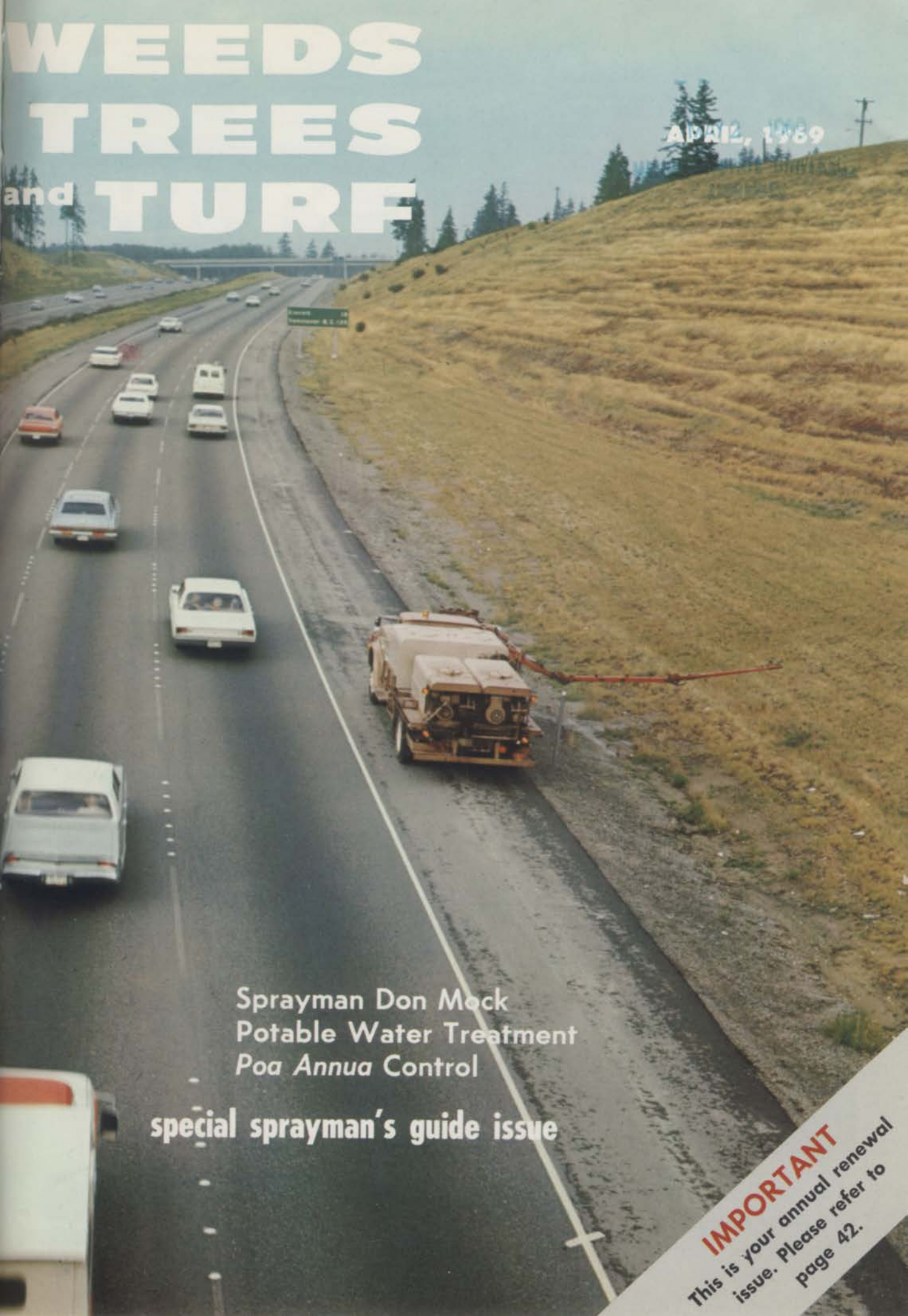


WEEDS TREES and TURF

APRIL, 1989



Sprayman Don Mock
Potable Water Treatment
Poa Annua Control

special sprayman's guide issue

IMPORTANT
This is your annual renewal
issue. Please refer to
page 42.



or



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The Cover

Don Mock, owner of Shamrock sprays freeway right-of-way near Seattle, Wash. This

type contract accounts for a large share of his business and his equipment is customized to do this specific job. For more about Mock and his operation, see page 6.

Michigan State Expands Park/Recreation Program

Michigan State University recently announced the creation of a Department of Park and Recreation Resources in its College of Agriculture and Natural Resources.

The new department is intended to prepare students for career positions in parks and recreation at state, federal and local levels of government. Its doctorate program will emphasize preparation for careers as researchers and college-level instructors.

Prior to his appointment as head of the newly created department, Professor Louis F. Twardzik was an associate professor in the university's Department of Resource Development and recreation specialist for the Cooperative Extension Service. Twardzik is the author of a book entitled "The Park and Recreation Commissioner" plus numerous papers on various subjects in his field.

"Current research projects are funded by state and federal agencies, and are expected to increase because of the demand for additional park areas and recreational opportunities in Michigan and throughout the nation," he noted. "The recently approved \$100 million state bond issue (Michigan) for recreation is just one indication of this demand."

WEEDS TREES and TURF

FORMERLY WEEDS AND TURF

April 1969

Volume 8, No. 4

Features

Highway Rights-of-Way Spraying	6
Potable Water Treatment For Aquatic Weed Control	8
<i>Poa Annua</i> Control Program By Dr. W. H. Daniel	12
Thatch Removal In Turf Management	18
National Arborists Meeting Report	21
Ninth Weed Science Society Report	26
State Fair Booth Promotes Sod Sales	31
Irrigation Stressed At Midwest Regional Turf Conference	32

Departments

Editorial: House Bill 1059	4
New Products	36
Meeting Dates	39
Insect Report	40
Classifieds	41
Advertisers Index	41
Trimings	42

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We have the highest regard for the U. S. Fish and Wildlife Service and for the various State wildlife agencies. But we hardly think they are the agencies of government to pass on government help and money in all areas of pesticide application.

Yet that's exactly what House Bill 1059, now pending as legislation in Congress, proposes. Section 2 of this bill states: "No officer or agency of the Federal Government shall initiate or provide any financial or other assistance for any program involving the use of any chemical insecticide, herbicide, fungicide, rodenticide, or other chemical for the purpose of eradicating or controlling animal or plant pests until such officer or agency has consulted with the United States Fish and Wildlife Service, and through such Service, with the head of the agency exercising administration over the wildlife resources of each State to be affected by the program."

We would ask Congressmen Dingell and Karth who are co-sponsoring this bill: Does this mean monies which the Department of Agriculture spends directly and through the state Land Grant Universities on pesticide research and publication of results? Does this apply to monies spent by the Department of Health, Education and Wel-

fare on research and testing programs? Where does it fit into the regulatory programs now in existence? Does a researcher of the Federal Government—in all except the Fish and Wildlife Service—have to check with the Federal Fish and Wildlife people (and let's not forget the kicker regarding State agency clearance also) before he can make pesticide recommendations at an industry conference?

These are only a few questions which come to mind. No mention has been made of the vast Federal pest control programs.

The point is simply that this bill needs to be defeated. True, more coordination may be needed in government. But this particular bill borders on the ridiculous.

Pending legislation such as this is in the same vein as the DDT legislative proposals now being bandied about in a number of our state legislatures and which we discussed last month. To digress only slightly, one of these proposes to limit the use of all chlorinated hydrocarbons to the practice of veterinary medicine and research.

Legislation affecting the industry needs careful consideration on other than an emotional basis and by knowledgeable and qualified persons. We urge each of you to visit with your own congressmen. And don't neglect your state legislators.

May

WEED & BRUSH CONTROL PLANNER



Timing Is Everything

May is the time to take care of hard to get at brush problems. Aerially applied chemicals can clean up problems in otherwise inaccessible terrain. It is the most economical and efficient way to get rid of brush along distribution lines or where spray trains cannot reach far enough. But aerial application works only if the spray is accurate—and if the chemicals are effective.

What to Use in May

To get a thorough kill of conifers and oaks use Brushkiller 170 plus Trans-Vert.[®] For mixed brush, particularly such hard-to-kill species as maple, use Industrial Brushkiller plus Trans-Vert. Adding Trans-Vert increases translocation to the roots. Result: less sprouting, better kill.

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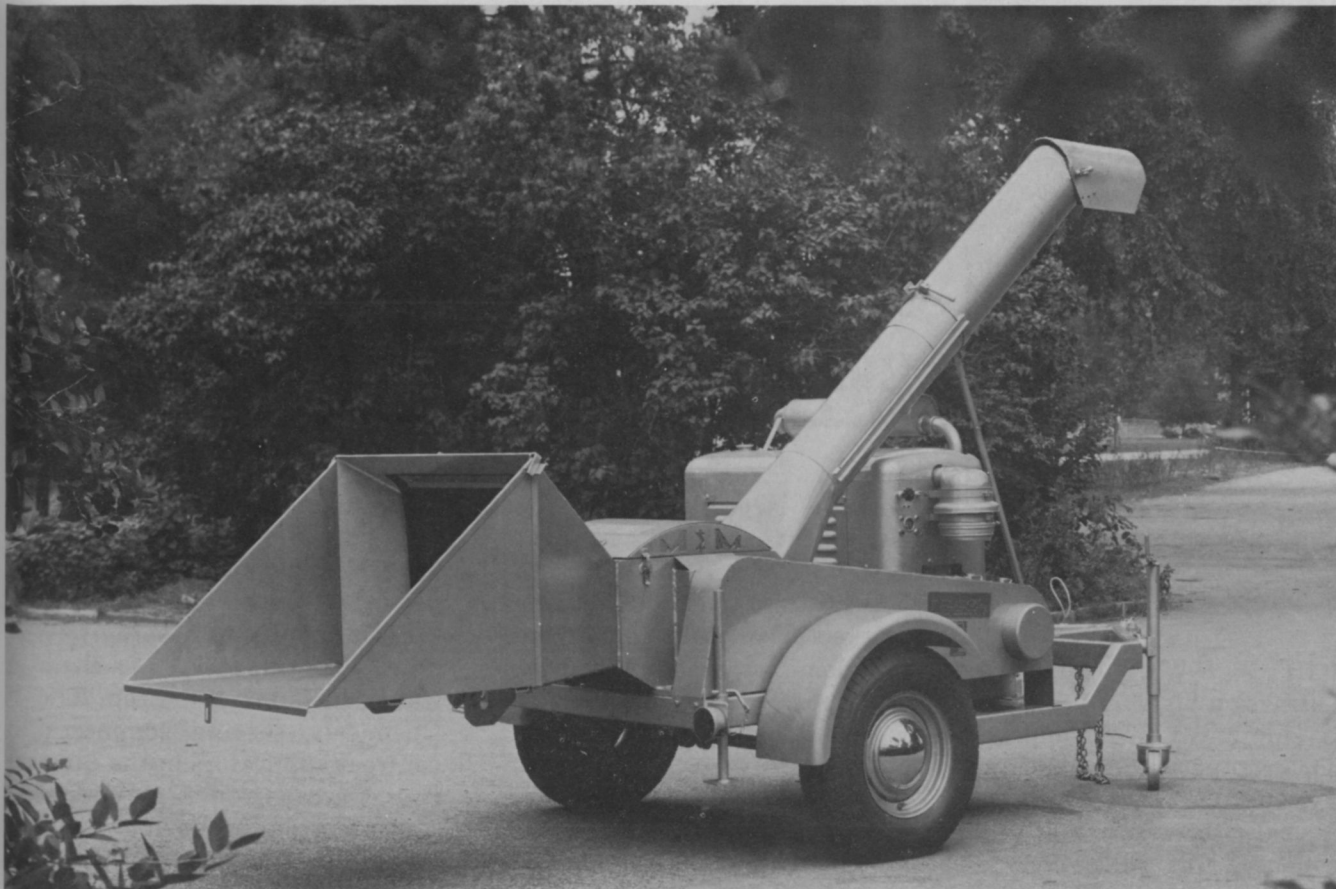
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HIGHWAY RIGHTS-OF-WAY WEED CONTROL

RIGHTS-OF-WAY spraying utilizes a big share of chemicals, equipment, and manpower in non-crop pesticide application today.

Typical of contract applicators who handle this job nationwide is Don Mock, owner of Shamrock Spray Service at Seattle, Wash. Mock owns two custom spray trucks and is equipped for all types of ground spray service.

One truck has three tanks, ranging from 800 gallons to 300 gallons in capacity. Each tank is used for one specific type of chemical to facilitate cleaning and eliminate contamination when switching from herbicides to insecticides. On his 3-tank truck, one tank is used only for a bare ground type herbicide, one for insecticides, and one for a selective herbicide. Each tank has its own pump and hose accessories.

The truck being used for highway rights-of-way spraying and pictured on this month's WTT cover is equipped with a modified Royal Bean dual side contourmatic 24' boom. Mock gets a full 55 feet of swath by using a broadcast tip.

Mock has also purchased a Cushman Truckster now equipped with tank, pump and booms for use on large turf areas and off highway use. He thus has

both the largest to the smallest equipment commonly in use today.

Until four years ago, Mock worked for another area applicator, doing ornamental and general pesticide application. He went into business for himself, and began specializing in contract work, primarily weed control in ornamental plantings on area highways. He uses four employees during the busy season and after only a few years in business, finds it difficult to keep up with the demand for service.

One of his summer employees is his 18-year-old son, Randy. Randy will graduate from high

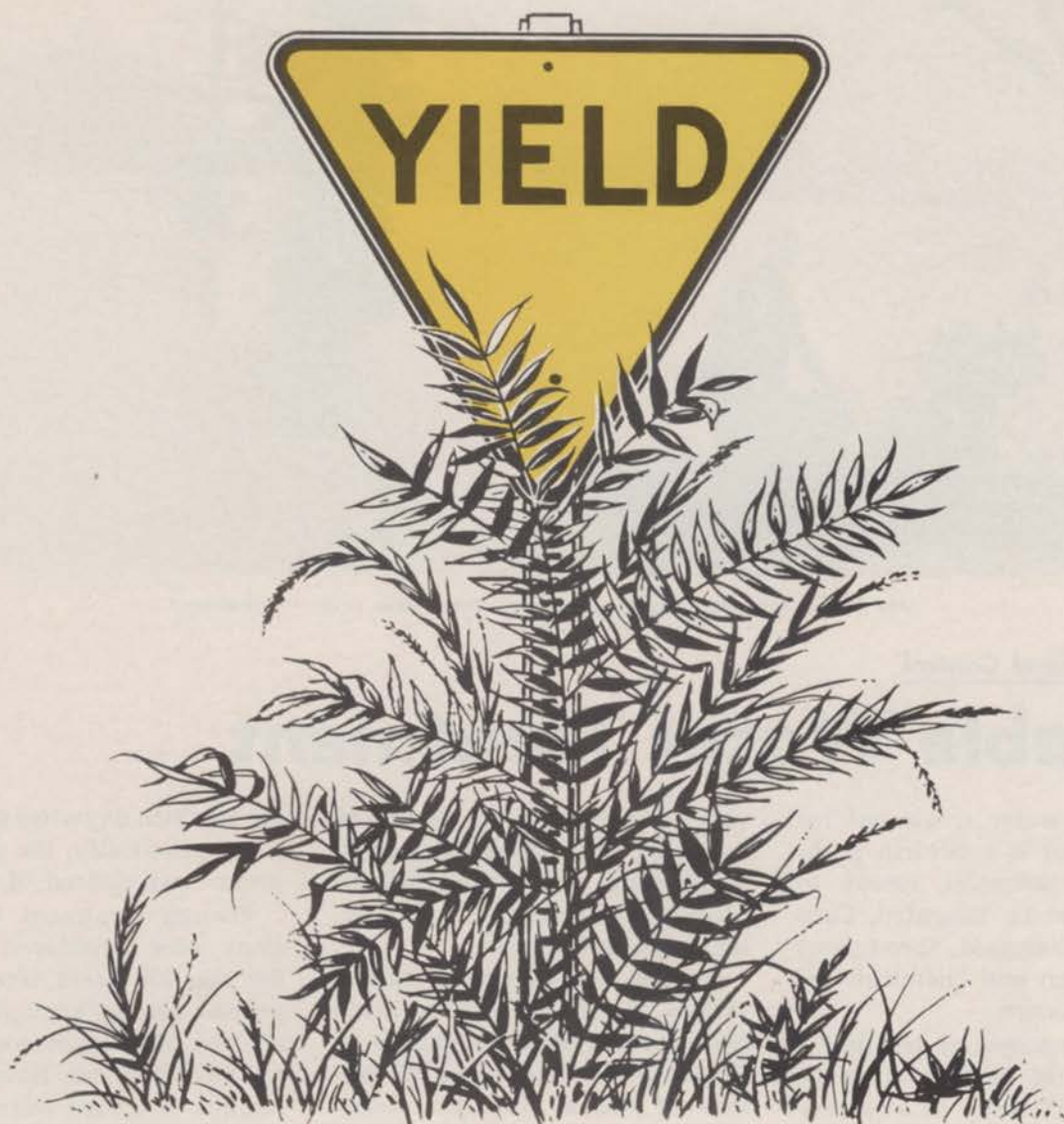
school this June and plans a college career to better prepare himself to become a permanent part of the business.

Besides running a spray business, Mock also serves as a chemical distributor for Crop King Chemicals, serving commercial contract applicators in the Puget Sound area. Crop King specializes in custom packaging of custom mixes of pesticides.

He is also active in the Northwest Spraymen's Association, being a past secretary-treasurer. Right now, Mock is serving as president of the Washington Association of Ground Sprayers, Inc.

Don Mock, left, always an active participant in the Pacific Northwest Spraymen's Association and past secretary-treasurer, discusses industry with T. P. Strand, Weaver Exterminating Co., Yakima, Wash., center, and Thomas E. Cowan, Uniroyal technical representative, Los Angeles, Calif., at an association annual meeting.





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Art Barret, left, and Raymond Corning check lake prior to treatment.

Aquatic Weed Control

Potable Water Treatment

Portable water treatment for weed control is a ticklish problem. Any potential threat to users cannot be tolerated. Care must be exercised throughout the operation and chemicals selected with care.

A good example of treating a reservoir 1100 surface acres in size, used primarily as a recreation area and ultimately as a city water supply, is the Chickahominy Reservoir. Located in the lowlands of Virginia, it eventually provides water for both Newport News and Williamsburg.

Treatment was made to control elodea and open fishing lanes. The Virginia Commission of Game & Inland Fisheries was in charge of the technical op-

eration. Directing the work and assessing results were Raymond V. Corning, supervising fish biologist, and Norville S. Prosser, district fish biologist.

Results far exceeded expectations. Some 200 surface acres were treated with 150 gallons of Potassium Endothal and 165 gallons of Diquat during a 3-day treatment period. An airboat with above water boom was used to apply the herbicides.

A strip treatment on 200 acres actually freed almost 900 surface acres of elodea infestation. Chemical applied at a combined rate of 1½ gallons per surface acre reduced infestation to the point that boats were able to operate in major fishing lanes within 11 days after application.

By the 34th day after final treatment practically, the entire reservoir was cleared of elodea.

Though treatment concentrations were considered low even for the 200 acres treated, they proved strong enough to clear all but the uppermost reaches of the 1100 acres. However, live strands of elodea were found in practically all areas of treated sections. These lead Corning and Prosser to believe that growth may return to former levels within about two years, unless phytoplankton populations are able to keep regrowth down by shading. Thus, retreatment may likely be necessary.

Population Expansion

More people building homes in the upper reaches of the Chickahominy River drainage area led to a nutrient buildup in the reservoir. Adding to this were increased recreational use of the reservoir itself. Brazilian waterweed or true elodea (*Egeria densa*) became established. At the time of treatment, practically all portions with water 12 feet or more in depth were infested. Heavy growths of elodea pre-

In Brief:

Data for this report on potable water treatment was supplied by Raymond V. Corning, Supervising Fish Biologist and Norville S. Prosser, District Fish Biologist, Virginia Commission of Game and Inland Fisheries. The entire report will appear in the current Hyacinth Control Journal. For more specific details on both treatment and findings, the Journal may be purchased from the Hyacinth Control Society, P.O. Box 9087, Fort Lauderdale, Fla. 33310. Attention: Dr. Lyle Weldon.

Send us your lake and we'll tell you how to weed it!

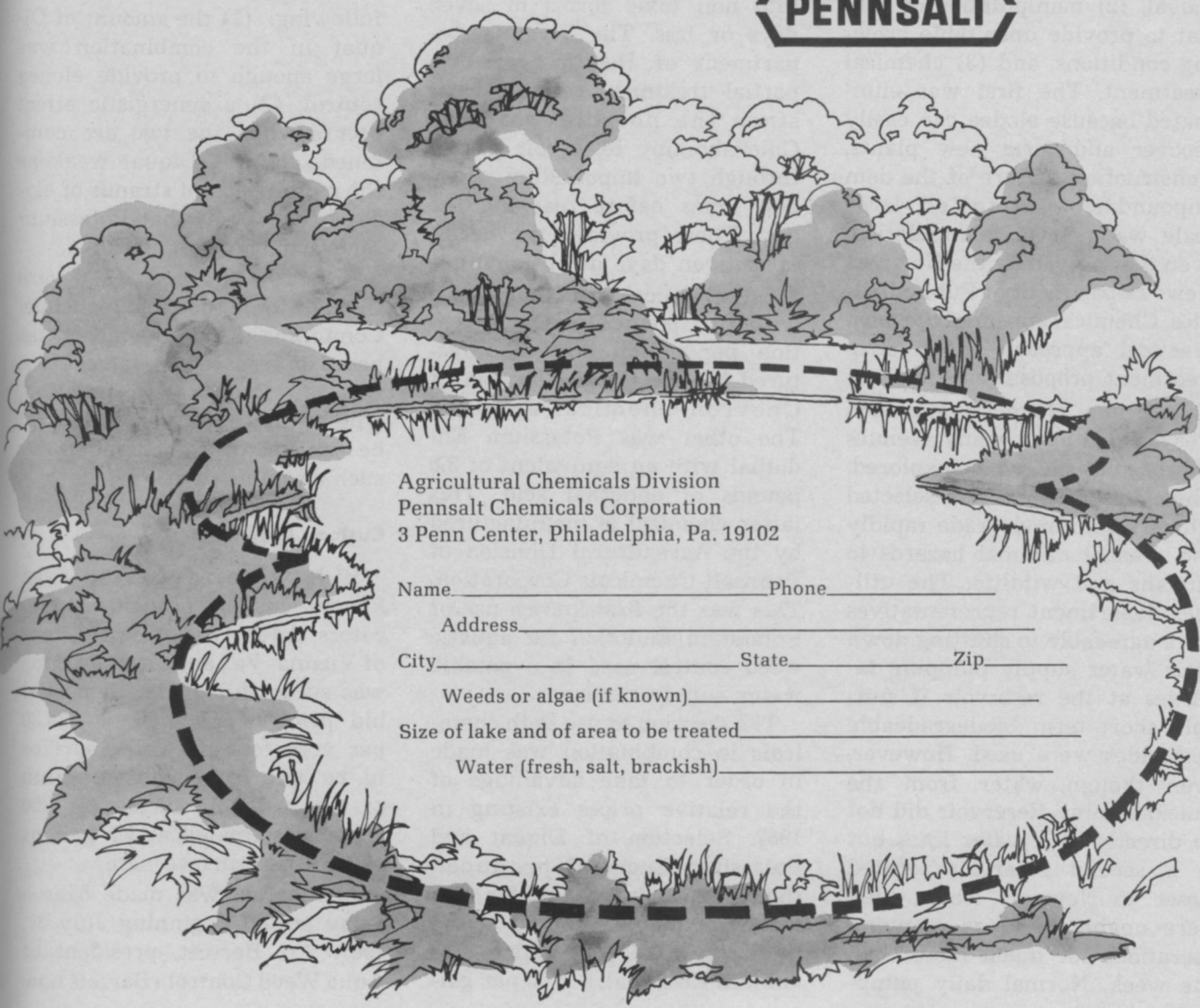
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Size of lake and of area to be treated _____

Water (fresh, salt, brackish) _____

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Before: heavy infestation of elodea.



After: same area one month later.

vented motor boat usage on side streams, coves and along shorelines during most of the summer months.

Studies were made by the Commission to determine one of three approaches to the problem of opening the lake. Corning lists these as (1) mechanical removal, (2) manipulation of habitat to provide unsuitable growing conditions, and (3) chemical treatment. The first was eliminated because elodea can easily recover and form new plants. Construction feature of the dam impoundment curtailed large scale water level manipulation, even if approved by the Newport News Department of Public Utilities. Chemical appeared the most practical approach and a strip treatment proposal was made.

Once the chemical approach was decided upon, many avenues of procedures had to be explored. Chemicals had to be selected which would biodegrade rapidly and present minimal hazards to humans and wildlife. The utilities department representatives were agreeable to shutting down their water supply pumping facilities at the reservoir if suitable short term biodegradeable herbicides were used. However, even though water from the Chickahominy Reservoir did not go directly into water lines but to a second reservoir located closer to Newport News, they were unable to cease pumping operations for much more than one week. Normal daily pump-

ing rate is approximately 22 million gallons. Prolonged stoppage of pumping would have caused dangerously low water supplies.

Two Chemicals Used

Two chemicals were selected, both of which according to tests and labels would break down into non toxic forms in seven days or less. The Virginia Department of Health agreed to partial treatment on this basis since the potable water in Chickahominy Reservoir passed through two impounding reservoir areas before reaching the city. These provided the necessary seven days detention time.

One chemical was Diquat used with two pounds of Diquat cation per gallon and manufactured by the Ortho Division of Chevron Chemical Company. The other was Potassium Endothal with an equivalent of 3.0 pounds of endothal acid. This latter chemical is manufactured by the Agricultural Division of Pennsalt Chemicals Corporation. This was the first known use of Potassium Endothal for aquatic weed control used in a potable water supply reservoir.

The decision to use both chemicals in combination was made in order to take advantage of the relative prices existing in 1967. Selection of Diquat and Potassium Endothal produced the greatest coverage for the money available. (Diquat at the time was \$32.50 per gallon. Potassium Endothal, \$16.00 per gal-

lon.) Diquat is a systemic weed killer, and Potassium Endothal a contact type. Killing action of Potassium Endothal is relatively slow and long exposure or usage in non flowing water is recommended.

Controlling characteristics of the two chemicals in combination were due to one or more of the following: (1) the amount of Diquat in the combination was large enough to provide elodea control, (2) a synergistic effect occurs when the two are combined, and (3) Diquat weakens the more resistant strands of elodea to the point that Potassium Endothal becomes effective.

Reasons (2) and (3) were thought to be the most plausible. Combining of two chemicals was based on research by James Parr, Pennsalt Chemical Corporation, which indicated elodea would be satisfactorily controlled by such a combination.

Custom Application

Bids were requested from known custom pesticide applicators. Aqua Weed Control, Inc., of Vienna, Va., and Orlando, Fla., was successful bidder at a total bid price of \$4877.50 or \$25.20 per acre foot of water surface to be treated. About one-sixth of the reservoir surface or 200 acres was treated at 1.5 gallons of mix per surface acre.

Application was made over a 4-day period beginning July 31, 1967. Art Barrett, president of Aqua Weed Control (Barrett now

operates National Weed Control Company at Orlando) used a 14-foot fiberglass hulled airboat, powered by a Corvair engine. About 5.4 surface acres were treated per hour.

Results

Areas treated the first and second days could be spotted on the fourth day of treatment by presence of dead duckweed. Strands of elodea were gathered from treated areas and showed discoloration and stem darkening on some strands.

Between three and nine days after treatment, elodea exhibited visible decay and reduction in abundance. A small fish kill was evident within a 16-acre test area long one shoreline. Death of fish was attributed to an oxygen sag caused by rapid decomposition of dead elodea. Some kill such as this was expected because of the size of the treated area and the luxuriant elodea growth. Heavily infested feeder creeks, even where less than half the total surface area was treated, showed some fish kill because of the marked oxygen sag. But the main fishing streams, Lacey and Johnson, experienced very light fish kill.

Eleven days after the final day of treating, no elodea was visible in the lanes treated along the reservoir proper. All major fishing lanes and fishing spots were clear enough to allow free boat passage.

An inspection made much later—213 days after treatment—showed that no elodea could be dredged from either treated or untreated areas in water depths which exceeded 5½ feet. In water one to five feet in depth, occasional strands of live elodea could be dredged up. Dredged strands from these shallow area were four to 12 inches in length and showed no signs of new growth.

A mid-summer inspection in 1968—319 days after treatment—led to important findings. Ex-

tensive concentrations of phytoplankton were visible in all portions of the reservoir. Luxuriant growths of elodea averaging 29 to 38 inches in length were found in the uppermost part of the reservoir. However, this was far from the sites of the original treatment. Only a few strands of elodea could be dredged up in other areas of the reservoir and these were confined to water depths of 3½ feet or less. In these shallow areas, new growth averaged nine to 15 inches.

Conclusions

1. Clearance of major fishing lanes and favorite fishing sites in the main reservoir was relatively successful within 1½ weeks of treatment. The basic treatment rate was ¾ gallon Diquat and an equal amount of Potassium Endothal per surface acre.

2. Most creek sections were heavily infested with elodea and were treated at rates above the recommended 1½ gallons herbicide per surface acre. Elodea reduction in these sections was considered fair to good. Short term treatment success in the creek sections was not directly proportionate to an increase in application rates, implying factors other than concentration were involved.
3. Shallow protected coves and guts treated at the rate of 1½ gallons Diquat-Potassium Endothal per surface acre gave ineffective control initially, but by the 34th day nearly all of these regions had been cleared.
4. Herbicide applied in fishing lanes within Johnson and Lacey creeks exhibited an

(continued on page 42)



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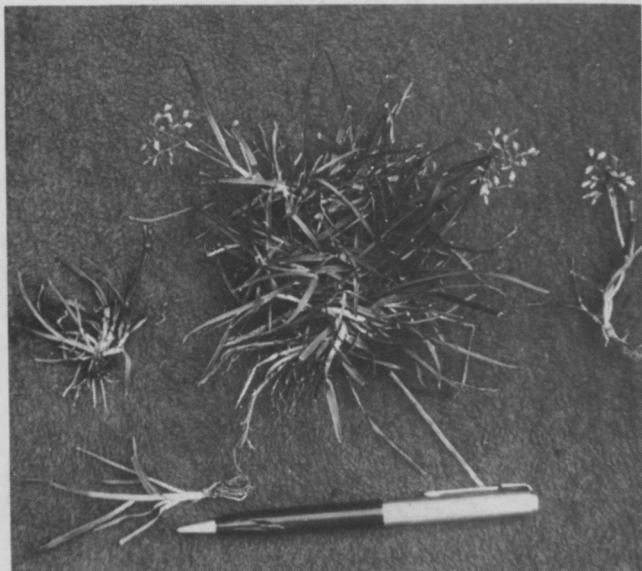
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Relative size of *Poa Annua* plant, seedhead and parts may be compared with pencil.

Control Program

Poa Annua

By WILLIAM H. DANIEL
Purdue University, Lafayette, Ind.

ARSENIC toxicity can selectively remove *Poa annua* in turf, thus *Poa annua*-free turf is a reality already proven in research and on entire golf courses. Recently a speaker used kodachrome pictures from over 30 golf courses to illustrate observed progress in this. Currently over 300 courses have some control program underway.

A four-step program is basic:

(1) Add no more soluble phosphorus. Why juggle two items? Why build reserves higher?

(2) Start accumulating toxic arsenic. Repeat lighter application, get uniform distribution. Allow time for new grasses to grow and fill in;

(3) Start improving stand of desired turf by using Aero-blade seeder or any way to get seed into the soil; repeatedly overseed as space and weather permit;

(4) Short or cloudy days, wet soil and time favor selective *Poa annua* weakening. Chickweed, *Poa annua*, crabgrass and goosegrass are less tolerant to arsenic than bentgrass or bluegrass. Ar-

senic interferes with the transfer of carbohydrates within the susceptible species.

Several states have declared *Poa annua* a weed in seed. For example, in 1968 Florida required that the number of *Poa annua* seed per pound of grass seed be listed on the label. Further, seed is prohibited from sale if above 5,000 seed/lb. And, it is hoped this limit can be reduced after one year of review.

Basically there are five points relevant to the control of *Poa annua*:

- **TECHNOLOGY**
- **TOOLS** to accomplish the work
- **TECHNIQUES** of using men and equipment
- **TIMING** for plant and user benefit
- **TIME** for biological processes

What Is Poa Annua?

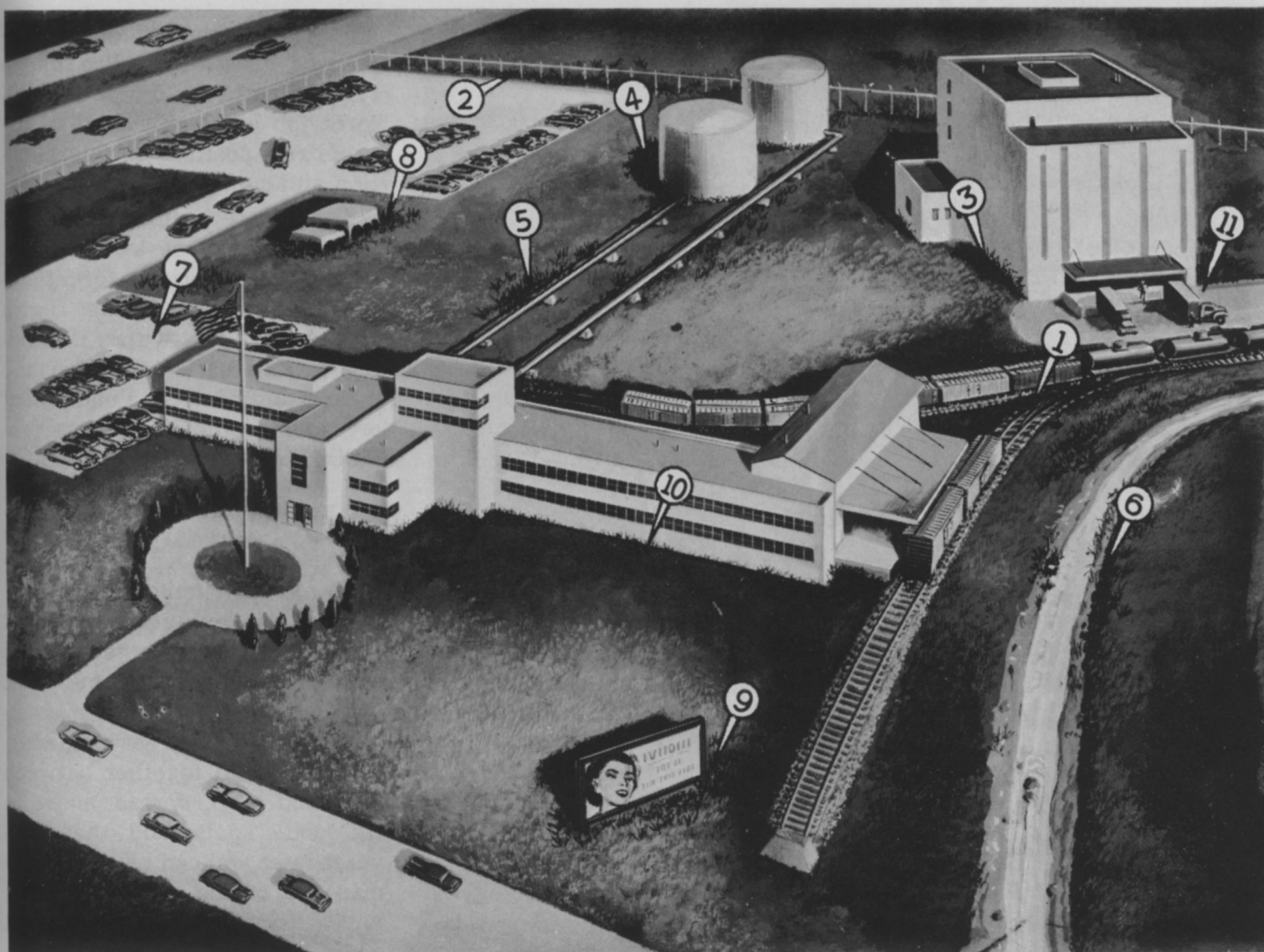
Let's describe *Poa annua*. *Poa* means "of the meadow" in Greek.

This includes hundreds of species scattered almost world-wide, of which *pratensis*, *compressa* and *annua* are representatives. The early botanist seeing *Poa annua* germinate and produce seed in the same season, which was in contrast to perennial types, called it *annua*, i.e., it seeds in 6 to 8 weeks after germination under some conditions. Now, it is just like tomatoes, coleus, etc.; it will vegetatively increase until some adversity kills the plant parts. You have seen summer desiccation, severe disease smothering under ice as such damaging failure points. Also, you have seen a beautiful sheen of new *Poa annua* come up.

I recall such on August 5 at Cleveland Country Club one year. The cycle of a normal *Poa annua* plant under watered fairway conditions in Cleveland would include fall germination, winter survival, spring lushness, summertime weakening, some disease, some wilting and, when things get really tough, complete loss either in the winter under ice or in the summer; but then new germination occurs. We can break this cycle and reduce the



Poa Annua



Railroad sidings (1) and security fences (2) are among the many locations where unsightly vegetation is a problem. Other locations in a typical plant where weeds can cause trouble are warehouses (3) tank areas (4) pipelines (5) ditches and roadsides (6) parking lots (7) storage areas (8) signs (9) around buildings (10) and loading docks (11). Take advantage of this market opportunity by selling "Hyvar" X, "Hyvar" X-WS bromacil weed killers or a product containing bromacil.

These 11 spots are potential trouble... they can mean more profit for you with **Hyvar® X bromacil weed killers** (or products containing bromacil)

There is expanding business and profit in selling Du Pont "Hyvar" X and "Hyvar" X-WS bromacil weed killers or products containing bromacil. They get rid of weeds easily and effectively. The potential market is great. Use of these weed killers can stop equipment losses, protect inventories, reduce fire hazards, increase operating efficiency, and keep up "the good housekeeping look."

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Much work on annual bluegrass and other turf problems has been done at Purdue University, Lafayette, Ind. Visiting at last month's Midwest Turf Conference are Purdue stalwarts, J. B. Peterson, head of agronomy department, left, William H. Daniel, agronomist and author of this article, center, and Richard L. Kohls, dean of agriculture.

competitiveness of *Poa annua*—the technology is available. Examples of success have been observed, reports of progress have been disseminated.

Technology

Selective repression of existing *Poa annua* and selective prevention of new establishment are the keys to effective control. It is a small job to control *Poa annua*; The big job is to grow desired grass!

We know that arsenic accumulated in the rootzone can over-ride phosphorus uptake and selectively stunt existing *Poa annua* as well as seedlings. We also know that Betasan, Balan and Bandane, among others, can prevent *Poa annua* seedlings from becoming established. Each chemical has its good and bad points; each will do certain things and permit the turf manager to do certain things.

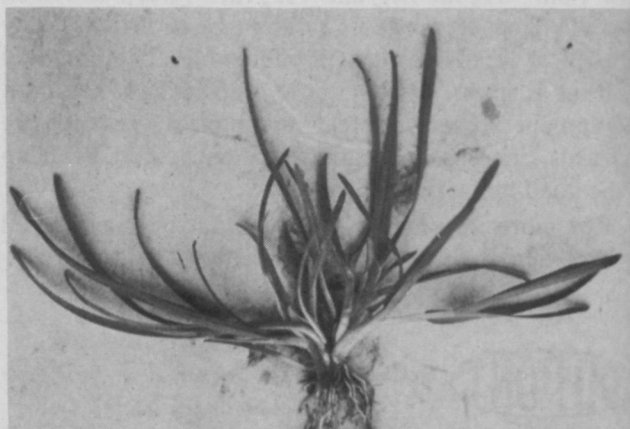
The turf manager should select a chemical for use in a repeated program to provide him with

continued control. Technology is understanding the inner-relationships of weed repression and forced growth—if desired—and the principles one must follow to benefit from the selective program. Forcing growth with fertilizer, protecting existing grass with fungicides, overseeding when thinness is evident—these are all part of technology.

Tools

The new Rogers Aero-blade seeder combination was recom-

Young immature *Poa Annua* plant is typical of those found in turf areas.



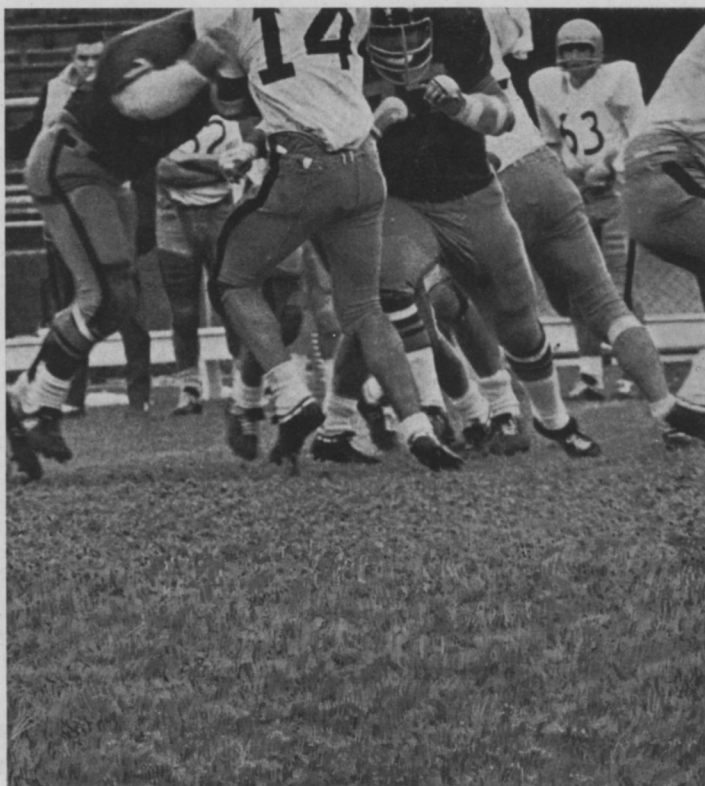
mended to five out of six golf courses considering *Poa annua* renovation because it does a uniform job of placing seed in the preferred position for germination and survival.

There are combinations of tools that may be available for spreading materials, for applying seed and reducing thatch and for applying water. Upgrading to automatic irrigation and purchasing of needed equipment are just preliminary steps providing tools for improvement.

Techniques

Techniques vary widely depending upon tools and terrain. Basically techniques are related to habits. I have seen golf courses start at the edge of the fairways, overlap in the middle with arsenicals just like they were mowing. They crowded together between the sand trap, spread apart in the wide spots, and then two years later you can see where the man did or did not go twice. I have seen where sprayers slowed down and killed everything, where equipment going downhill went fast and uphill slow so that extreme differences in results were achieved. Even calibration, simple as it is, can be overlooked.

With repeated accumulations, records are important. If we miss out on how much has been applied, uncertainty prevails. For example, we strongly recommend that no soluble phosphorus be used when arsenic is being



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This was a very real problem at Kingston Stadium in Cedar Rapids, Iowa. Every year this stadium is home field to 3 Cedar Rapids public schools, 2 parochial schools and one college! They played 33 football games there last year and hosted 20 half-time marching band ceremonies.

The Director of Plant Facilities for the Cedar Rapids Community Schools told us that the turf in Kingston Stadium became awfully bad long before their season was over. He felt they had two choices. They could put in a synthetic turf at a cost to the taxpayers of about \$250,000 or they could make one last try with real grass.

And they chose Golf Brand sod to make that one last try with. In May, 1968, Martinson Sodding and Grading Company of Cedar Rapids laid Golf Brand sod in Kingston Stadium. It was fertilized four times, aerified once a month and watered as needed.

How did Golf Brand turf do? Great! The best playing field ever. The turf stayed green right down the middle through the very last game. A great playing surface . . . and a great savings for taxpayers too!

This fall, the sod in Kingston Stadium was top-dressed with ¼" to 1" of dirt and they'll reseed as soon

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Golf Brand lawn seed is often the solution to big turf problems. It adapts itself very well to a wide variety of conditions. It takes terrible punishment and keeps on growing thick and strong and green . . . like a "living carpet". It could be the answer to *your* problem. Let us tell you more about growing grass in problem areas. Send for the two free Northrup King Technical Bulletins below.



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Basics of Turf Grass Blends and Formulas
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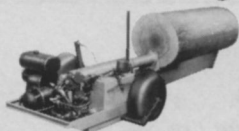
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accumulated in *Poa annua* reduction. With this in mind it takes understanding of technology and different techniques of purchasing. If one does change his program and uses some soluble phosphorus, then arsenic, who knows where he is? In contrast, if only arsenic is used, then one seeing results can interpret the end results and know where he is.

Timing

Timing is always important, whether it be fighting the bull in the arena or working to get the most from nature's normal responses. When shall the program start? Early fall is preferred. When shall it achieve toxicity? One year later. When shall I put on seed? When there are openings. When shall I put on arsenic? When stress of climate is medium. How soon may I repeat overseeding? Every two weeks. How often may I apply arsenic? After next rain or irrigation. How much shall I apply? All of these are related, thus it is very wise to have samples, models.

Take trips and see other areas previously treated. And, as mentioned earlier, it is strongly suggested that timing be concentrated into one fairway, three fairways, or nine fairways. Don't start on eighteen fairways. Set some timing fast and some slow. Treating half fairways is simplest and safest during initial programs for the "best" half can be used. All clubs I know of that started a program later enlarged the control program. (At Brae Burn, Art Anderson used lead arsenate in 1938, '40, '44, '47, '51, '55, '59 and '64 to maintain his program.)

The Bluegrass Cycle

You understand a bluegrass seed. It will germinate in 6 to 18 days, puts up one leaf, starts a crown, puts up a second and third leaf. As it starts its fourth leaf it also starts a tiller at the crown, then a second tiller. Now

it has some 8 or 9 leaves, and it is at least two months old—still a seedling. Then it puts out underground rhizomes, a horizontal stem that, as it emerges, causes spread characteristic of bluegrass. Now it is a "teenager." A bluegrass planted August 1 with irrigation could have rhizomes in November, but a seedling dropped carelessly in October may be useless and dried by desiccation in the winter so there is nothing next spring. Meanwhile, *Poa annua*, which grows more normally and vigorously, completely overmasks it.

For example, at Meridian Hills Country Club in Indianapolis overseedings made in two successive falls produced a very sparse bluegrass cover of less than 5%. When arsenics kept out the *Poa annua* and crabgrass, the less than 5% advanced to over 95% in one season.

The purpose of overseeding is to initiate sparse starting plants which, by spread, can fill in. Bentgrass grows similarly, making stolons. Bentgrass plants two to three months old are still very small. Actually, where arsenics are being used, at least 90% of the turf increase is from spread of existing plants. For high budget courses, plugging of thin areas is a real possibility in critical spots.

Arsenic Toxicity

Toxicity with arsenic can be summarized by the following steps:

- (1) Stop applying soluble phosphorus;
- (2) Improve poor drainage areas with vertical trenching;
- (3) Gradually build arsenic toxicity by repeat divided applications;
- (4) Repeatedly introduce the desired by overseeding and plugging;
- (5) Resod the worst first (for example, fronts of tees and aprons); and,
- (6) Cloudy days, short days, wet soils and time favor selective *Poa annua* weakening.

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NS-4-67

TEN years ago, few were aware of a "thatch" problem. Yet today, it is a much discussed topic in turf management circles. Recognized as a common culprit in most grasses and virtually every area, thatch condition is inviting more and more investigation.

Opinions differ in what thatch is, and why it exists. One authority defines thatch as "the accumulation of a dense felt of undecomposed dead roots and stems through which water cannot penetrate." This felt, or matting, forms between the soil surface and the visible green vegetation. Thickness may sometimes increase to one foot or more.

Few turf areas are immune. Many landscapers are astounded to find how far such a build-up can advance. Once thatch build-up begins, a cycle is started which feeds upon itself rather rapidly until grassed areas may become almost choked out.

A principal reason for the relatively recent emergence of this problem is the pressure for lush, ultra-green turf areas, whether in lawns, parks, institutions, roadsides, or wherever. New strains of grasses have been introduced which guarantee a quick, dense cover. High-potency fertilizers and chemicals are used in profusion to speed the growth. Mowing increases, as does the layer of thatch when clippings are returned to the soil. Clippings, of course, are hardly the only reason for thatch build-up. Yet the fact remains that thatch seems to thrive best in highly managed turf areas. By contrast, this problem seldom exists in poorly kept, thin lawn areas which receive minimal attention and few chemical aids.

Probably the most troublesome effect of thatch is build-up of a barrier to water penetration. More frequent watering in increasingly larger amounts become necessary to meet plant needs. Runoff becomes a problem. Fertilizers and chemicals

Turf Management

Thatch Removal

lose effectiveness because of difficulty in penetration to the soil. The cumulative result is a turf low in vitality and subject to disease. Further, the thatch barrier continues to build.

Though there is disagreement on cause and effect of thatch, most turf specialists agree on the need for removal by powered-rakes, introduced some years ago by several manufacturers. First real usage of this type of equipment came in the tool rental field. Residents of "suburbia" became alarmed when their lawns didn't measure up to the expected blue ribbon of beauty. Reading of the thatch problem, they rushed to their local rental store seeking a method to escape the back-breaking chore of removing thatch with a hand rake.

Several manufacturers responded as many as 10 years ago. They developed units to do the job mechanically. Today these are as varied as the opinions on why thatch exists in the first place. Different units comb, slice, pull, flail or cut the thatch out. Most do a fair job. Some are excellent. An important point to remember is that it does little good to remove one inch of a six-inch thatch mat. The unit used should employ a dependable height adjustment so all thatch may be removed. Equipment must be sturdy. Few turf jobs are as rugged as thatch removal. Another important consideration is the ability of equipment to get close-in to beds and other tight areas. Some units offer a variety of rotors, adaptable to various types of grasses and all areas.

When considering addition of power-raking equipment, a turf manager may do well to check with his local tool rental dealer. Rented tools are subjected to daily abuse. Such equipment gets

little care or consideration from the user. Few units are jolted and jarred more than a power-rake. Finding equipment which will hold up under years of thatch removal duties may well save both money and headaches.

When to Rake

The next question is when to rake. Early spring seems the most popular time likely because at this period turf care is on the agenda. The tendency is to rake, fertilizer, weed, and seed. However, there are drawbacks. In effectively removing a dense thatch barrier, it is often necessary to lower a rotor considerably. Resultant appearance of a turf area can be alarming. Though this condition is only temporary, fears of the operator sometimes result in less than the most thorough job.

Many authorities maintain that early fall is the ideal time for raking. Removal of thatch at this time, when lawns are receding into a dormant stage, results in no dramatically disappointing appearance. Further, winter moisture is allowed to penetrate.

Other management procedures are often recommended, depending on intensity of the problem. Aeration can help considerably, as can proper fertilization.

The thatch problem exists virtually everywhere. Any good management program should include power-raking, probably once each year. A plug cut from a particular turf area quickly spells out the extent of the problem. Various types of power units are designed to solve any particular situation. But the operator is to be reminded again that in attacking the problem, he should remove it properly and completely. An effective program can produce gratifying results.

At Last...An Answer to Thatch Problems!

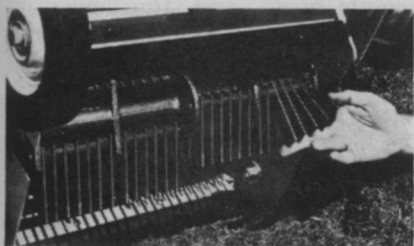
Thatch...a relatively new term, but a growing problem each year. We, at "Blue Bird", recognized the need for mechanical means of solving this thatch situation years ago.

Turf Management Headaches

We had learned from turf authorities that thatch meant many things, each a headache to turf management: plant growth was hindered; fertilizers couldn't reach the soil; water penetration was inhibited. Plus the fact that this matting provided an excellent environment for disease. Yet no means of removing it was available except the back-breaking chore of using a hand rake.

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out the thatch, but because these blades are free-swinging, they bounce back when encountering rocks or other obstacles... no metal fatigue, no costly breakdowns.

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ducer. High performance, virtually no maintenance. Figure it out... isn't the "Blue Bird" the unit *you* want to use to eliminate the thatch problem?



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Yeats' Northwest Spray Fertilizes Home Lawns In Minutes.

Few homeowners would attempt to fertilize a lawn in three minutes—even if it contained only 6000 square feet.

But this is routine with John Yeats, owner of the Northwest Spray Company at Spokane, Wash. Yeats, a ground sprayman and a member of the Pacific Northwest Spraymen's Association, also handles turf fertilizer contracts.

One special job has been fertilizing home lawns for personnel at Fairchild Air Force Base in the state of Washington. This is a government contract bid. The one this last year called for putting fertilizer on 1566 lawns. The contract allowed him exactly 10 eight-hour days to cover the lawns which averaged 6000 square feet in size. That's roughly three minutes per lawn.

Yeats handled the job with a 4-man crew, using both hand and small tractor distribution equipment. The 36½ tons of fertilizer used was a 26-10-10 formulation; 23% of the nitrogen was derived from urea formaldehyde and 3% from ammonium phosphate. With 1200 pounds of urea formaldehyde per ton of fertilizer, an extremely dusty material, Yeats found it neces-

sary for his applicators to wear face masks and goggles.

For the uninitiated, bidding on a government contract can be a unique experience. Bids are made on regular government invitation bid forms. These are normally very specific as to materials used and the specified time when the work must be done. For example, once the fertilizer application bid was awarded Yeats, he had only 10 days from the date of notice to complete the job. The contract period could be extended only in event of adverse weather or spreading conditions, and then for only another 10 days. Most bid forms call for basic bids plus various alternates.

Subsequent to award of the contract and also prior to doing the job, Yeats was required to attend a pre-service conference at the Air Base procurement office, to become acquainted with all aspects and requirements of the contract.

This type operation, while routine for a government installation, may offer some suggestions for home owner community type projects. Homeowners as a group could no doubt attract more favorable service contracts if able to act as a group.

Pictured above, Yeats' spraymen don face masks and goggles when applying fertilizer. Supply truck and equipment are standard in Yeats' operation.

National Arborist Winter Convention



Officers of the National Arborist Association elected at the February convention are, left to right: first row, Immediate Past President Kenneth P. Soergel; 1969 President Paul R. Walgren, Jr.; second row, Treasurer Glenn Burns; 2nd Vice President William P. Lanphaer III; 1st Vice President William A. Rae; and Secretary Riley R. Stevens.

Arborists' Program Includes New Chemicals, Urban Tree Problems

Though heavy snows blanketed some parts of the nation, sunshine greeted attendants of the National Arborist Association Annual Convention held at the Sheraton Hotel at Fort Lauderdale, Fla., Feb. 8-13.

Association officers elected at the meeting are as follows: president—Paul R. Walgren, Jr., Walgren Tree Experts, Hamden, Conn.; first vice president—William A. Rae, Frost & Higgins Co., Burlington, Mass.; second vice president—William P. Lanphaer III, Forest City Tree Protection Co., Cleveland, O.; secretary—Riley R. Stevens, Ste-

vens Tree Surgery, Portland, Ore.; and treasurer—Glenn Burns, Karl Kuemmerling & Associates, Canton, O. Immediate past president is Kenneth P. Soergel of Cross Roads Nursery & Tree Service, Gibsonia, Pa.

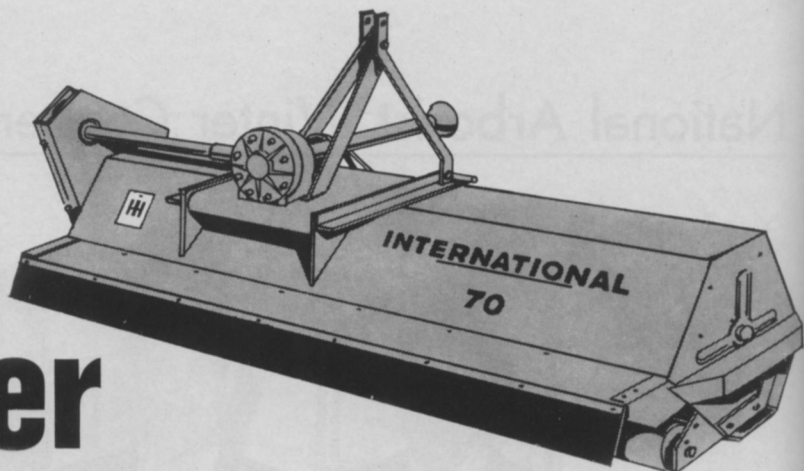
Newly elected board directors are: Robert Felix, Harder Tree Service, Inc., Long Island, N.Y.; John Shullenberger, Gustin Gardens Tree Service, Inc., Gaithersburg, Md.; and George Goodall, Goodall Tree Expert Co., Portland, Maine.

First speaker on the program was Frank S. Santamour, Jr., research geneticist at the U. S.

National Arboretum in Washington, D. C. Discussing "Trees for the Urban Environment: Problems and Prospects," Santamour enumerated some of the reasons why cities are not ideal for growing trees; tall buildings that block sunlight; toxic chemicals from industry and automobiles; intense summer heat radiated from buildings and pavement; salt used in de-icing roads.

Trials of pollution tolerance can be made in special fumigation chambers where seedlings are exposed more to toxic pollutants, he revealed. Recent

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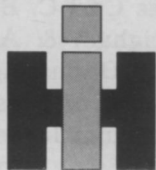
International 70 flail mower is the one mower built to protect people while it fine-cuts high grass and tough weeds. Protects your operator, property and other people—whether in the mowing area or in passing vehicles. Here's how the International 70 flail mower puts safety first:

1. Eight-eight overlapping, reversible knives rotate to drive sticks, stones, cans, other debris toward the ground, not out the back or sides of the mower.
2. The heavy-duty mower housing is contour formed and bead-welded to a husky frame. The housing helps contain and guide objects to the ground.
3. A thick rubber safety curtain at the discharge end of the mower won't let objects bounce out. This heavy curtain, unlike canvas types, won't rot, rip or shred.
4. The universal joint is shielded. A bumper guard is available to protect the bearings on the mower while

cutting close to trees, fences, walls.

5. And operator safety is standard—with the International 2444 Lo-Boy tractor—the perfect power match for the mower. The 2444 tractor has a low profile and a low center of gravity. Big, wide, single or dual grass tires prevent sidehill drift, won't gouge turf. Differential lock and live PTO are standard.

For more *safety first* features, see the International 70 flail mower and 2444 tractor team at your dealer. His flexible financing plans can help you over budget problems.



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studies have indicated that white oak, white ash and many pines are sensitive to ozone but that spruces, firs, sugar maples and European linden are more tolerant. Pollution tolerance is inherited, Santamour contends, and differences within species and single-tree progenies have also been demonstrated. Thus it's possible to not only select trees for tolerance but to use these trees to breed improved types, Santamour said.

While we are familiar with major disease problems of urban trees, we tend to be rather unfamiliar with soil-borne fungi, he said. Abnormal soil and environmental conditions under which city trees exist make them more susceptible to fungi that would merely be saprophytes on good sites, according to Santamour.

In concluding, he stresses that research to select and breed trees for an environment of the future should begin *now*.

Sales Experience

Unusual sales experiences was the topic of O. J. Andersen of Trees of Houston, Houston, Texas. One case he cited was that of transplanting three oaks for Neiman-Marcus for \$20,000. Andersen's firm had salvaged the huge 16-foot-diameter trees from an old school ground.

Don't be afraid to charge your customers enough to make a profit, Andersen warns. A \$7000 tree is not out of line for a \$10 million building. Trees of Houston purchases fine trees on land to be razed for highway rights-of-way and sells them to clients up in years who move into 1-story homes, he said. Many of these retired people, even though they can usually afford any price, are initially shocked at the cost of these trees. However, he continues, if you are a salesman instead of an order-taker, you can sell them. His firm is finding it's not too hard to sell a man a tree for \$750 or \$1000. It's almost impossible to

make a profit planting \$50-\$100 trees, he says.

Another situation Andersen cited was one in which his firm bought an old house for \$50 . . . just for a tree on the property. Selling the tree for \$3500, he said, they gave the house away free to wreckers.

Leadership

Third speaker on the program was Carl C. Brigham of Carl C. Brigham & Associates, Atlanta, Ga. Discussing "The Five Demands of Personal Leadership," Brigham listed them as follows: (1) Being emotionally mature; (2) Learning to predict human reactions; (3) Deliberately overestimating the importance of the other person's point of view; (4) Being yourself without underestimating yourself; (5) Taking a genuine interest in other people.

The "amateur" in business, Brigham contends, doesn't know the rules—and what's worse, doesn't *know* he doesn't know. The "pro," on the other hand, knows and plays by the rules: he accepts responsibility for his actions, has a code of conduct, has learned to distinguish between "urgent" and "unimportant," and keeps his time balanced well, says Brigham.

Leadership, he continues is a sum total of many things: personal example, vocational competence, effective human relations, guidance in personal problems and motivation.

Henry A. Spies, vice president of Alexander & Alexander, Inc., New York City, gave his views on "A Modern Program of Insurance Protection."

Your risk exposure must be carefully chartered and evaluated, Spies cautions. You must decide what must be insured to guarantee your firm's protection and what risks you can afford to self-assume.

Popular "package deals," while often sufficient, may include some overlapping, Spies

said. Insuring material value of small importance and overlooking the much larger dollar value exposure produced by claims from the public for bodily injury or property damage is not uncommon, he revealed.

Equipment Check

To be on the safe side, he continued, equipment should be checked daily; sky worker buckets and booms should be insulated against contact with live wires. Eye protection is extremely important; hard hats should be standard equipment. Chipper troughs should be extended out far enough to prevent workers from reaching the drum area; a solenoid brake on the drum will minimize free-wheeling action following power turn-off, he says.

Don't overlook possible injury to the public from falling debris, overspray or crop and livestock contamination, he warns. Helicopters and other aircraft should have adequate liability-property insurance, he added.

As more sophisticated chemicals come into use, additional care in application is required, he said. While many unjustified claims are presented by the public, legitimate damages do occur which can be minimized by proper planning and the use of good equipment by trained and well-informed employees.

Dr. W. D. Thomas, Forestry Specialists, Chevron Chemical Company, Richmond, Calif., then spoke on "New Chemicals in Arboriculture."

Chemical solutions to arboricultural problems commonly used today are those that arborists have worked out for themselves, Thomas reveals. Although the agricultural chemical industry is beginning to awaken to the needs of arborists, until the industry realizes that arboriculture is a big business, treemen will have to continue dabbling with "home-made" mixtures, he said.

New formulations of old chemicals and new chemicals—such as Dibrom and Difolatan—are coming to the fore to fill arborists' as-yet-unsatisfied needs, he said.

Through a mutual liaison between the arborist, the state or federal specialist and the agrichem specialist, new chemicals in arboriculture are on the horizon, Thomas concluded.

Don't Underestimate Bee Stings, Warns Brandt

Bee stings can prove fatal to hypersensitive golfers, cautions James W. Brandt, president of the Golf Course Superintendents Association of America and superintendent of the Danville (Ill.) Country Club.

Although most insect stings cause no more than slight discomfort, in rare cases of hypersensitivity one bee sting can cause death, says Brandt. Many bee-sting fatalities could have been prevented, he laments, if the victims had known of their susceptibility prior to the sting.

Brandt suggests seeing a doctor soon to determine whether you are overly sensitive to insect venom. By starting proper medication now your resistance can be built up by the time golf season begins, according to Brandt. The American Medical Association reports that such therapy has proved effective for about 95 percent of those treated for stings.

Based on other information from the AMA, Brandt calls attention to the following tips that may help avoid attracting insects and prevent stings:

- Insects sting only in self defense when threatened or disturbed, especially if their nests are endangered. They are apt to attack something that stirs the air and excites them.

- Bees seem to be attracted to and/or angered by dark colors.

Light pastel shades don't seem to annoy them.

- Insect repellents may help in avoiding insects.

- As insects are attracted to floral scents, avoid using aftershave, colognes or other cosmetic preparations before teeing off.

- If a bee, wasp or yellow jacket flies close to or lands on you, try to stay still or move slowly. Chances are, if you attempt to brush it away the motion will frighten the insect, and it will attack.

Study Shows No Pesticide Residue Buildup to Date

Analyses of soil samples from all parts of the country have failed to show any buildup of pesticide residues, according to Dr. Paul F. Sand of the U. S. De-

partment of Agriculture's Agricultural Research Service.

Speaking at the Weed Society of America meeting recently held in Las Vegas, Sand explained that an expanded soil monitoring program was initiated last year to get information on residues in both cropland and non-cropland soils. About 15,000 sites were sampled throughout the United States, Sand revealed. A pesticide history is kept for each site and soil samples are analyzed at the Gulfport, Miss., lab. The work is continuing.

"Once the initial pesticide soil status report is compiled for each area, we can go back periodically and retest to see if residues are building up or decreasing," Sand said.

It will be a long-term project, he concluded, as it will take several years to develop an accurate picture of what is happening to pesticide residues in our soils.



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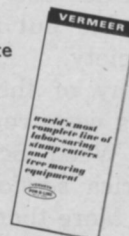
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Weed Science Society executive committee, seated, left to right: Dr. Arnold P. Appleby, secretary, Oregon State University, Corvallis; Dr. Dayton L. Klingman, vice-president, Crops Research Division, Beltsville, Md.; Dr. Boysie E. Day, immediate past-president, University of California, Riverside; Dr. Glenn C. Klingman, president, Eli Lilly & Co., Greenfield, Ind.; and Dr. L. L. Danielson, president elect, USDA, ARS, Beltsville, Md.; and standing, Dr. Earl G. Rodgers, editor of "WEEDS," University of Florida, Gainesville; and Dr. Fred W. Slife, business manager and treasurer, University of Illinois, Urbana.

Ninth Weed Science Society Meeting Features New Herbicide Technology

Weed science is making undreamed of advances in technology. Researchers are at the point of pinning down the specific action of pesticides in soil and plant life. New research holds early promise of not only pinpointing pesticide persistence, but of methods to break down such persistence by formula.

Thus, environmental safety coupled with increased weed control and improved use of water have become prime goals of the industry. Each advance makes pesticide use not only more palatable but of increasing use to society.

Many of these new developments were reviewed at the recent Weed Science Society of America session at Las Vegas, Nev. More than 250 papers were presented and almost 1000 weed

science researchers on hand to discuss the industry.

The need for continuing efforts in weed prevention were highlighted by Dr. Robert J. Anderson, associate director of USDA's agricultural research service. He reported that farmers are now spending \$2.5 billion a year to control weeds but are still losing more than 13 per cent of their crop production. He also noted that 2 million Americans are afflicted each year with skin poisoning or skin irritation caused by weeds such as poison ivy.

The society's highest award, honorary membership for life, went to Dr. Erhardt P. Sylwester, extension weed specialist in Iowa. Dr. Sylwester was born on a farm in Sibley County, Minn. He received his bachelor's and master's degrees from St. Olaf College and his PhD from

Iowa State College. He started as a forest pathologist, then became extension botanist and plant pathologist at Iowa State College before being named head of the Iowa State College Seed Laboratory. Since 1952 he has developed one of the finest extension weed control programs in the U. S. He has served the North Central Weed Conference since its inception in 1944 and has been president and chairman of this and other weed conferences. He has received the USDA Superior Service Award. As a longtime active participant in the Weed Science Society, Dr. Sylwester has been influential in training many of the current generation of weed scientists.

Two members of the society received plaques as joint authors of the outstanding paper pub-

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Awarded honorary life membership in the WSSA was E. P. (Dutch) Sylvester, Extension weed specialist at Iowa State University, Ames.

lished in "Weed Science" in 1968. They are C. R. Swanson and H. R. Swanson of the USDA. Their paper was entitled: "Inhibition and Degradation of Monuron in Cotton Leaf Tissue by Carbamate Insecticides."

New officers for the coming year are: president, Dr. Glenn C. Klingman, director of plant science, Eli Lilly Co., Indianapolis; president-elect and 1970 program chairman, L. L. Danielson, plant physiologist and leader in weed research in horticultural crops, USDA, Beltsville; vice-president, Dayton Klingman, agricultural research service, USDA, Beltsville; secretary, Dr. Arnold Appleby, farm crops department, Oregon State College. Dr. F. W. Slife remains as treasurer and business manager; and Dr. Earl G. Rodgers of the University of Florida continues as editor of the society's journal, "Weed Science."

The next meeting of the society is to be held at the Queen Elizabeth Hotel in Montreal, February 3-5, 1970. John Bandy of the University of Guelph is in charge of local arrangements. Plans have been made for the 1971 meeting in Dallas and for the 1972 meeting in St. Louis.

Pesticide Decomposition

A new technique has been discovered that allows scientists to chemically duplicate, in their laboratories, the effects of living microorganisms on pesticides in soils.

Scientists have long known that soil microorganisms play an important role in destroying persistent herbicides. But, until now they had no way of knowing just how the microorganisms brought about these beneficial effects.

Dr. Jack R. Plimmer of USDA's Agricultural Research Service described the method that he and his colleagues, Dr. Philip C. Kearney and Mrs. Ute I. Klingebiel developed in studies of atrazine, an s-triazine herbicide.

Earlier findings showed that the herbicide could be destroyed by a soil fungus that biologically split one side chain from the chemical molecule. The new technique enables scientists to produce similar reactions in a test tube without the presence of microorganisms or any other living cells.

In developing the technique, the researchers found that radicals, or very reactive chemical groups, generated by a simple system, produced reactions

which removed both side chains from the molecule, thus permitting the test-tube observations.

Now that this important advance has been made, the researchers plan to extend their studies to similar types of herbicides. With this technique, they expect to produce metabolites that are difficult to isolate in nature. By studying the properties of these new products produced by pesticides, they hope to learn more about the safe use of pesticides and environmental hazards.

Rights-of-Way

Chemical treatment of power line right-of-ways can be effective in controlling undesirable woody plants. Reporting on a 15-year study of vegetation development following chemical woody plant control in central Pennsylvania, Dr. W. R. Byrnes said he and Purdue colleague, Dr. W. C. Bramble, applied initial treatments, including selective basal, semi-basal and broadcast foliage sprays in 1953, with follow up basal sprays in 1954 but with no further chemical treatment until 1966.

"The original chemical sprays were highly effective on the woody brush," Byrnes reported, "resulting in 94 to 99 per cent topkill among the five chemical treatments applied. Furthermore, the follow up basal sprays caused virtual elimination of tall-growing tree species."

Byrnes stated that ground layer vegetation on the right-of-way developed into a dense, vigorous community of bracken fern, sedges, herbs, and blueberries while such plants were very sparse in the adjacent undisturbed forest.

"Broadcast and semi-basal sprays drastically reduced plant cover and altered species composition of the ground layer," Byrnes related, "however, after 12 years these treatment areas had returned to the original



Awarded plaque for best paper award was C. R. Swanson, Crops Research Division, USDA, Stoneville, Miss. Co-author H. R. Swanson was not available for picture.

compact Bracken-Sedge-Herb-Blueberry community."

"The basal sprays," he continued, "selectively removed woody brush with only minor disturbance of ground cover plants. The shrub sweet-fern invaded all treatment areas and gradually developed into a dominant species on the right-of-way by 1968.

"Wildlife species, particularly deer, rabbit, grouse and turkey, utilized the right-of-way treatment areas for food and cover," Byrnes pointed out. "A low woody shrub border selectively developed along the edges of the right-of-way has been particularly beneficial for deer."

Herbicide Activity

The effectiveness of amiben, a widely-used herbicide, may be prolonged by chemical modification. Amiben, a selective herbicide applied as a preemergence treatment to control grass and

broad-leaf weeds in many crops, rapidly loses effectiveness when exposed to light.

However, Dr. Alan R. Isensee, plant physiologist of USDA's Agricultural Research Service, reported a way to reduce the light-sensitivity of this herbicide. Experiments indicate that chemical modification of the amiben molecule by benzylation of the primary amino group may provide a way of reducing photodecomposition and possibly improving the performance of herbicide.

In laboratory research, amiben, N-benzoyl amiben, and their methyl esters were irradiated in solution. After 2 to 4 hours, Dr. Isensee reported that amiben and its methyl ester were inactive herbicidally but the N-benzoyl derivatives were fully active after 6 hours irradiation.

Applied on a soil surface at 1, 2, or 4 pounds per acre, amiben

lost 11 to 14 percent activity after 8 hours of sunlight. However, he said N-benzoyl amiben suffered no loss during the same length of time. These results indicate the possibility of increasing the usefulness and persistence of a herbicide by slight chemical change, Dr. Isensee said.

Herbicide Persistence

Of five herbicides tested in Idaho, only one continued to persist in the soil after 50 days of incubation, according to Dr. Lambert C. Erickson, agronomist, University of Idaho. Erickson said that five herbicides were applied pre-emergence at five rates in five spring sown crops. The herbicides were in-gran, picloram, linuron, silvex and dicamba. The five crops were Pirolina barley, Idaed 65 wheat, Summit flax, Improved



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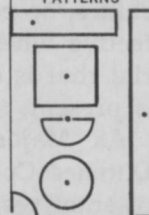
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Alaska peas, and Mingren sunflower.

"Major emphasis was given to detecting herbicide translocation symptoms in the seed crop. Thus far our study shows that via germination bioassays only dicamba shows evidence of such transmission and it shows only in peas," Erickson stated.

Concerning the possible pollution of the soil by long-lasting residues, Erickson reported that soils treated approximately May 20 were sampled on September 1, and later tested by pea bioassay for the presence of herbicide residues.

"Detectable residues were found for all herbicides for all rates," he explained. "However, after 50 days of incubation in the greenhouse, the soils were again bioassayed and no residues were found except for picloram."

Erickson also reported that these studies revealed no significant effect on the chemical composition of plants.

Perennial Weed Control

Putting chemicals on weeds to make them grow might seem a strange way of eradicating weeds, but scientists at Stanford Research Institute believe this may be the answer for certain perennial weeds.

Dr. Charles A. Beasley, manager of SRI's Plant Biology Laboratory, has managed to manipulate the growth pattern of Johnson grass so that the plant is more vulnerable to herbicides. The objective of this research is to allow the plant to be killed with a single application of herbicide.

"One of the major problems with applying herbicides to Johnson grass is that while one part of the plant is growing vigorously other parts may be in various stages of dormancy," Dr. Beasley explained. "Herbicides usually kill only those parts which are active, and are relatively ineffective on the dormant buds."

In laboratory experiments a chemical called Ethrel (2-chloroethane phosphonic acid), when applied to Johnson grass, acted in such a way as to cause most of the vegetative buds to become active simultaneously, allowing one application of herbicide to eradicate the entire plant.

Bartles Continues Fight Against Wood-Burning Ban

William H. Bartles of W. H. Bartles Tree Service, Hyde Park, N.Y., has quite a few bones to pick with the ban on open burning of wood, brush and leaves. While no one can deny the need for preventing air pollution, Bartles says, the major contributors to this pollution—motor vehicles and industrial smokestacks—should be attended to and not the "little guy," i.e. "smoke from wood, which burns clean anyway."

Municipal disposal areas, already taxed to capacity by a throw-away society, are now faced with the additional problem of incorporating logs, brush and stumps into their land fill system, he says. Governing officials, instead of trying to repeal the unnecessary ban on open burning of wood, are going to great lengths to dream up impractical ways to make the anti-wood burning resolutions work.

One scheme that will gobble up tax dollars, according to Bartles, is the "chipper plan." This proposal pertains to the use of chippers to dispose of brush and logs dumped at central sites. Officials fail to realize—and do not ask experienced tree service businessmen about limitations of chippers, Bartles says. These machines, he points out, are not effective when working on material that is dirty or when metal is present.

As Majority Leader of the Dutchess County Board of Representatives, Bartles has questioned the wood-burning ban from the beginning. His guest

editorial in the April, 1968 issue of **Weeds Trees and Turf** Explained why the ban is unsound.

In his continued fight to repeal the ban in New York State, Bartles has proposed that sites be picked in open areas where private individuals and municipalities can truck their burnable wood by-products and debris. Crews could then rotate from site to site and burn the piles under proper atmosphere and safety conditions.

This plan, he says, would lessen the load on town disposal areas where garbage is now being covered in the land fill method. It would also provide persons in the tree service business a place to properly dispose of such debris.

"It is impossible to level and cover 'uniformly' as the rules specify, and it is not practical to use any other method of disposal than burning," Bartles contends.

In his fight to get state authorities to repeal the wood-burning ordinance, Bartles and others have sent copies of specially passed resolutions to the governor, state legislators and every county government in New York. They also called a special meeting to present to state and federal officials reasons for seeking the repeal of the ban.

Bartles reveals that hearings have been held by the Board of Health in New York in answer to ever-increasing pressure to revise the resolutions. Some changes may come about, he reveals, although he cannot tell what they might be.

Bartles has asked that every New York tree service company will contact their governing officials to try to make them see the impracticability of the chipper plan. The Dutchess County proposal—which has since fallen through due to lack of funds—would have cost half-a million dollars for the first three years, he reveals, and the plan would not have worked. Federal funds were to have been used.



SOD INDUSTRY SECTION

State Fair Booth Promotes Sod Sales For The Borbonus Brothers of Idaho

Cloverdale sod grower Hans Borbonus uses an exhibit booth at the state fair to promote sales for his Boise, Idaho, operation.

Borbonus believes it is an excellent method of recruiting new customers. Last year at the Western Idaho State Fair he pulled 10,000 booth visitors. At a location near the main door of the chief exhibition building, he set up a small knoll which was covered with "instant lawn." An attendant was on hand at all times to encourage visitors to examine the product.

Besides fresh sod, Borbonus used a background of trees and a birdbath. A garden table and bench completed the motif, along with a few logs for effect.

Manning the booth is the key to success in promotion. Attendants spent sufficient time to discuss advantages of sodding for a new lawn. Many visitors were surprised to learn that sodding can be done in Idaho during all seasons except when the ground is frozen or covered with snow. Also, the fact that a complete lawn requiring only normal maintenance can be readied

shortly after receiving an order proved to be impressive.

A handout entitled "The Instant Lawn," also proved most

helpful. This promotion piece features sod growing and harvesting at the Cloverdale Nursery and Turf Farm and is a guide

Cloverdale Nursery fair booth which attracted 10,000 visitors at Idaho State Fair.



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Midwest Regional Turf Conference



Sod is loaded on trailer trucks for installation by Cloverdale crew at landscaping site.

to preparation and sodding. It includes details on soil preparation, fertilizer applications, installation, and maintenance of the new lawn.

Potential customers were varied. They included apartment house owners, motels, commercial first, and homeowners. A number of parents with small children were interested in sodding only a small portion of their lawns.

Borbonus reports that it is difficult to evaluate immediate sales effect of the fair booth promotion. But he feels that potential sales for a number of months following the exhibit are reasonable. He believes the promotion well worth the cost as an advertising medium.

The farm is operated by Hans Georg Borbonus Landscaping, Inc. Hans Georg is president and his brother, Gerhard, vice-president. They handle 80 acres.

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Irrigation specialists on conference program are, left to right: Charles Watson, Toro; John Dunlap, Oakwood Country Club, Cleveland; Walter Wilke, March Irrigation; A. J. Miller, Miller Sprinkling Systems; and Thomas Kramer, Kirchdorfer Irrigation.

The Midwest Regional Turf Conference held every year at Purdue University offers a most intensive study of the industry. A round-up of current information is available on practically every subject which ties into the turf picture.

Program participants are specialists in their many fields as well as their own companies or educational institutions. Organization is superb, thanks largely to William H. Daniel, executive-secretary of the Midwest Regional Turf Foundation and Purdue agronomist, and the extensive facilities and faculty at Purdue.

Attendance for the 24th meeting this last month reached a new high of 741 by the beginning of the second day's program. A few sod growers and others registered after this to increase this figure slightly. Golf course superintendents accounted for the major segment of the group. Probably the most sophisticated program series this year featured irrigation. Specialists from a number of companies and golf course superintendents discussed

the current types of systems in detail.

Miller Irrigation

President of Miller, Sprinkling Systems, Royal Oak, Mich., Austin J. Miller, told turf personnel that today they can have every switch, knob, fuse, clock and push button in the golf superintendents office, pumphouse or clubhouse. The other extreme is also possible and controllers can be scattered around the course in 20 or more locations.

The superintendents operating automatic systems are in the best position to give direction in establishing the happy medium, he said. No one solution is right for every course. Most superintendents recommend four to six satellite controller locations. This keeps the wire or tube runs reasonable and allows the operator to see the sprinkler he is turning on when manually operating the controller.

At the satellite locations, Miller pointed out, there should be separate controllers for greens, tees and fairways. Some superin-

tendents are even suggesting separate controllers for the sprinklers at the approach to the greens.

These satellite controllers should have no more than one automatic valve per station and must be capable of automatic, semi-automatic or manual operation independent of the central program. Miller said that by providing each satellite with a 24-hour starting clock, it can function fully automatic in case of a central program failure from fire, lightning or wire break. Each satellite controller should have a lightning arrestor on the primary electrical supply and a copper ground rod connected to the cabinet. Controller cabinets need to be on a 42" concrete base to prevent frost heave and resulting misalignment in later years. A concrete pad in front to stand on and at least a 12" concrete apron on the other three sides will permit mowing around the controllers and eliminate hand trimming. He pointed out that by supplying the satellite locations from the closest electrical source, wire size and distance is reduced. This usually means two or three sources of power, Miller said, thus reducing reliance on a single source.

Miller raised the question of central control. Central control or central programming, he believes, should be reserved for those functions the superintendent wants done from the office. This can be as simple as a Yes—No switch. Yes—I want water tonight, or No—I don't want water tonight. It can be as complete as remoting every function available at the satellite.

It is generally felt, Miller said, that central control should let the operator start irrigation program for greens, tees and fairways independent of one another. Syringing of greens, tees and fairways should also be independent and the syringe time should be variable.

Miller pointed out that it is

New officer slate, left to right: Theodore Woehrle, vice-president; Robert Meier, Jr., president; and Dr. W. H. Daniel, executive - secretary.



possible to also have an on-off switch for each controller on the course so that parts of the program can be omitted. Appropriate lights on the panel will indicate switch position or the function in operation.

Of utmost importance, he said, is an emergency switch for turning off the program during operation. A sudden shower or call from the clubhouse that a sprinkler is running can make this

switch useful. An adjustable rain switch which will shut down the program after two tenths inches or more of rain might save a two a.m. drive to the course during a thunder shower, Miller stated. The controllers should automatically re-set to off after the above switches go off. Control of these remoted functions can be in a panel box mounted in the maintenance building or superintendent's office.

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Lee Schmidt, left, and Joe Williamson each received a \$300 golf course superintendent scholarship. Making the presentation is Norman Kramer, right, vice-president of the Golf Course Superintendents Association of America, Benton Harbour, Mich.

Most automatic systems, Miller pointed out, will cost over \$100,000 and when spending this amount of money the program deserves the services of a Professional Engineer with considerable experience in golf course irrigation. He cautioned against depending on a free plan from a material supplier or contractor.

March Irrigation

Walter Wilkie, March Irrigation and Supply Company, Muskegon, Mich., stated that most people blindly look upon any form of an automatic underground sprinkler system as a universal panacea to all of their watering needs. However, he pointed out, this is not the case. While many operators are appreciative of their system, they are somewhat disillusioned at the demands of the work load that they have fallen heir to as they try and implement the automatic system.

Wilkie said that installation on any given golf course will require from 18 to 36 controllers, depending upon the size and the

geography of the course. These are normally located in three or four controller areas. Management and operation of these controllers dictates success or failure with the system.

Award Program

Two Purdue University seniors majoring in turf studies received scholarship awards at the annual banquet.

They were Joe Williamson, Highland, Ind., and Lee Schmidt, Carmel, Ind. Each received a \$300 golf course superintendents' scholarship.

Also recognized were two January, 1969, Purdue graduates, each a recipient of a \$200 Mueller scholarship. They were David A. McManama, Carmel, and Dan Brier, Williamsport, Ind.

Newly elected officers of the Foundation for 1969-70 are Robert Meier, Jr., 6319 Wiche Road, Cincinnati, O., president; Theodore Woehrle, Birmingham, Mich., vice president, and W. H. Daniel, Purdue turf specialist, re-elected as executive secretary.

Witnesses Help Kill Proposed DDT Bill In Washington State

Washington State legislators at a joint hearing of both houses recently killed a proposed bill to ban DDT and other chlorinated hydrocarbon pesticides.

Jack Daniels, well-known veteran pesticide applicator and past-president of the Northwest Spraymans Association, appeared as a witness in opposition to the bill. Daniels' testimony along with other qualified witnesses proved sufficient to convince legislators of the need for a go-slow policy regarding outright bans.

Daniels said in his statement regarding DDT to the group that he had "lived with it, breathed it, practically bathed in it, and never had any ill effects." He also stated that "there is no case on record of a death from DDT. It would be a tragedy to be deprived of it. The loss of these materials far outweighs the loss of a few fish and birds."

Washington State agricultural chemist, Richard Maxwell, said that "to the best of our knowledge, pesticides do not pose a danger to public health." He further stated that the effect on wildlife is not so certain and needs more research.

Backers of the bill to ban the pesticides used the popular line that pesticides concentrate in the fatty tissues of the bodies of fish, who eat the plankton that absorb the poisons. Fish, according to these statements, if they are not killed, are eaten by birds whose eggs fail to hatch.

Appearing in favor of the ban were housewives, University personnel, and a member of the Seattle Audubon Society. Fighting the bill were forestry association personnel, farm operators, entomologists, and commercial spraymen.

Florida School Considers Beautification Project

An innovative project in beautification, termed the "campus-park concept," is being considered at Lake City Junior College and Forest Ranger School, Lake City, Fla., that would involve botany, biology, forest ranger, turf and park management and timber harvesting students.

The project, still in preliminary planning stages, would hope to: beautify the buildings and grounds; establish recreation and service areas for the college and community; and supply training sites and facilities for students, it is reported.

For example, the creation of a "green" biology pool behind the science building would not only enhance appearance of the area but would provide at-hand material for students in botany and biology classes.

Air Pollutants Damage Plant Life, Says Darley

"We can't grow plants in dirty air," Dr. Ellis Darley, who is from the Air Pollution Center, University of California at Riverside, warned attendants of the combined conference of turfmen, arborists and nurserymen held recently at Colorado State University.

Odorless, invisible air pollution—mainly from automobiles—is damaging to plant life, Darley reports. Sun shining on the gases, such as sulfur dioxide and fluorine, given off by cars forms photochemical air pollutants, and these damage plants, he contends.

Although some plant varieties appear to be resistant to this pollution, many are not, he says. Vegetables develop brown-spotted leaves and become unsalable. Pine trees turn brown, their needles falling off. In the San Bernardino Valley alone, Darley cites, 25,000 acres of pine trees

have been affected in this manner by photochemical air pollutants.

Flowers—especially petunias—are also susceptible; 40-60 percent of Los Angeles' roses, carnations and orchids are affected, he reveals.

"We can't solve this problem until we realize that we breathe community air," Darley concludes. "We can't point to industry, for this is a community problem—we all drive cars."

Balchem Process Retards Migration of Herbicides

New York's Balchem Corporation has recently developed an encapsulation process designed to prevent or retard migration of herbicides in the soil.

Balchem contends its new process, soon to be patented, prolongs effectiveness of herbicides that exhibit mobility through soil leeching or volatilization. It's economical, too, as less herbicides are required when the process is utilized, according to Balchem.

For details write the company, Box 175, Slate Hill, N.Y. 10973.

Safe Pesticide Practices Stressed in UC Manual

The much-discussed combination of safety and pesticides is the main topic of "Pesticide Information and Safety Manual" put out by the University of California's Agricultural Extension Service.

Write for a copy to J. Blair Bailey, Pesticide Safety Specialist, Agricultural Extension Service, University of California, Berkeley, Calif. 94720. Cost of each manual is \$2.50; checks should be made payable to the Regents of the University of California.

California Program Saves Valuable Roadside Trees

A new program already underway in the Sacramento area for saving trees along freeway routes was recently announced by the California State Department of Public Works.

Trees on land purchased as rights-of-way for freeway construction will be examined, and those considered compatible with highway conditions will be preserved either through local care or highway maintenance work, it was reported. Many of these trees have died in the past due to lack of care.

In addition to preserving trees in their natural setting, the new policy also calls for the uprooting of palm, olive and certain evergreens capable of being stored in a tree "bank." Therefore valuable trees, even those in the direct path of construction, will be salvaged.

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RAPID-GRO

For More Details Circle (109) on Reply Card

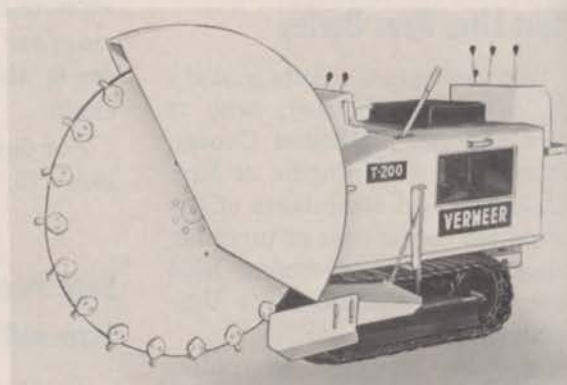
New Products . . .

Designed for the Vegetation Care Industry



Joseph T. Ryerson & Son, Inc. provides landscapers with rot-proof perimeter strips of flexible, heavy-duty $\frac{1}{4}$ " or $\frac{3}{8}$ "-thick Ryerson steel to simplify grounds maintenance and add beauty plus protection to driveways, athletic tracks, flower beds, etc., says Ryerson. Strips separate grass and gravel, stop weed growth along fenced areas, according to the company. Installs easily and permanently—16' or 20' strips fasten securely in place with tapered steel stakes driven through slots punched in the strips every 30 inches, Ryerson explains. Installed properly, edging lets mowers glide right over it. For more details circle (701) on reply card.

Vermeer Manufacturing Co., Pella, Iowa, now offers its new Model T-200 Root Cutter attachment that fits the company's T-200 Pow-R Trencher; attachment can be quickly removed for trenching, says Vermeer. Revolving cutting wheel features heavy-duty, carbide-tipped teeth that cut roots down to 18 inches below the ground's surface. Entire unit is mounted on rubber padded crawler tracks. For more details circle (702) on reply card.



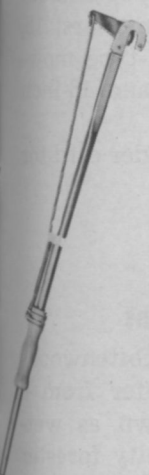
International Harvester Company has recently developed its new Sand Trap Rake in conjunction with the needs of a greenskeeper at one of the nation's leading golf courses. This new unit, International Harvester contends, cuts manhours required for raking sand traps by 50 per cent, which frees maintenance workers for other chores. Uniform penetration of the rake eliminates hardpan and cultivates weeds and grass out of traps, according to the company. For more details circle (703) on reply card.



W. J. Heinrichs, Inc., Reedley, Calif., offers its Mini Turfmaster self-propelled dump truck that holds 3000 lbs. Features include: heavy-duty hydraulic cylinders; speeds to 20 mph; high flotation tires (no tire marks from heavy loads). For more details circle (704) on reply card.



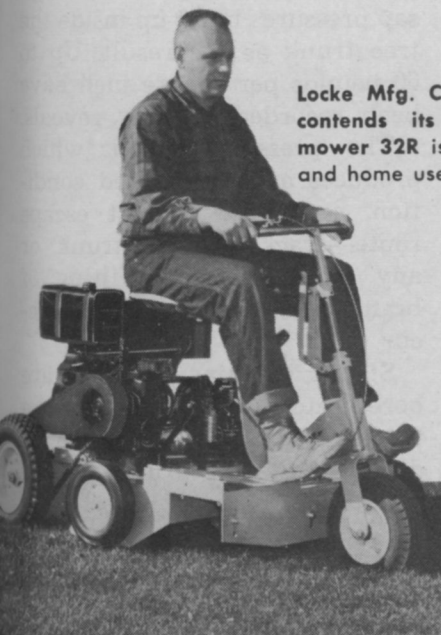
Model #6 tool chest by Weather Guard Chest, St. Louis, is 18-gauge iron painted with white enamel and measures 69" long by 14½" deep. Provides ample storage plus side and rear visibility. Model #5 has section for power saw. Both have lockable hasps. For more details circle (705) on reply card.



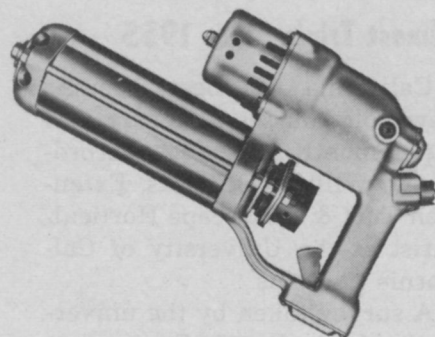
Lightweight aluminum Pruning Wand by Clyde Cutlery Corp., Clyde, O., ends ladder-climbing and arm-scratching when pruning to height of 10 ft., even inside dense shrubs. Easy pump action makes steel blade slash through branches to ¾" diam. For more details circle (707) on reply card.



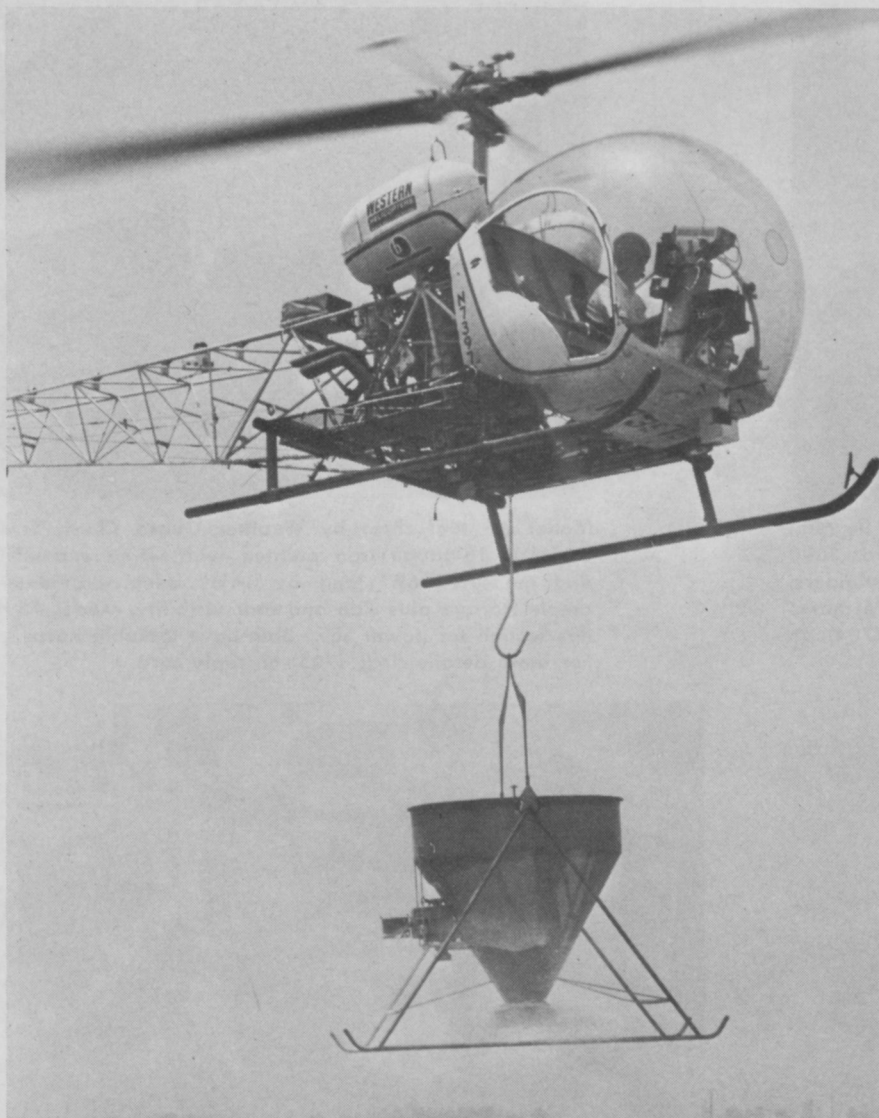
Sporty as well as protective are Smithco, Inc.'s (Wayne, Pa.) new red and white carousel canvas tops for the company's "Red Rider," "Red Ranger" and "Ranger-23" vehicles. Designed for driver and passenger protection in inclement weather, the tops and framework can be quickly and easily attached, says Smithco. For more details circle (706) on reply card.



Locke Mfg. Cos., Inc., Bridgeport, Conn., contends its heavy-duty rotary riding mower 32R is ideal for both institutional and home use. Unit boasts handling ease, comfort and maximum safety, says Locke. Devere-Locke 32R has 9-hp engine, steers with handlebar assembly with short turning radius. Cutting height adjusts from 1" to 4", with side trim on one side. Cutter arms and blades are statically balanced. For more details circle (708) on reply card.



Shown above, 1 of 4 Electromagnetic Hammer models recently acquired by POW-R-TRON, INC., Home, Pa., formerly produced by Syntron Div., FMC Corp. Hammers offer wide assortment of tooling plus long life and low maintenance (piston is only working part), says POW-R-TRON. For more details circle (709) on reply card.



Helicopter fertilizer/seed spreader, called the Sling-King, has been developed by Transland Aircraft, Inc. The unit is radio controlled and requires no hydraulic lines to the helicopter. Thus, no power take-off is needed from the helicopter engine. The unit has a 27 cubic foot fiberglass hopper, weighs less than 150 pounds and covers swath widths up to 85 feet. Capacity of hopper is 800 pounds of pelletized urea. A 3½ hp, 4-cycle, gasoline engine powers the spreader. (For more information, circle (710) on reader service card).

California Golf Courses Almost Triple Since 1955

California has been opening new golf courses at the rate of 3 per month since 1960, according to William B. Davis, Extension Turf & Landscape Horticulturist at the University of California at Davis.

A survey taken by the university's Agricultural Extension Service in 1967 revealed that the state's golf courses actually in play totaled 665, with more than 50 courses either under construction or on the drawing board for

completion by 1970, Davis reports. This figure is a far cry from 1955's total of 234 golf courses.

Almost 60 percent of California's courses are regulation 18-hole, ranging from 5000 to 7000 yards with pars between 65 and 72, says Davis. About 22 percent are regulation 9's with pars from 32 to 36.

How much land is occupied by California's 665 golf courses? About 67,679 acres, according to Davis. Few crops produced in the state, he adds, require the amount of irrigation, fertiliza-

tion and continuous harvesting that must go into producing acceptable areas for the game of golf.

Bunton Offers New Equipment Catalogue

The 1969 Bunton mowers and trimmers catalog is now ready for distribution. The catalog features self-propelled rotary power mowers, rider attachments, conventional push-type rotary power mowers, trimmer-edgers, trimmers and complete specifications for the complete line.

The Bunton Company manufactures this complete line of mowers and trimmers which includes: 21, 24, 28, 32, 36 and 52-inch self-propelled mowers; 18, 20 and 21-inch push-type mowers; and 8, 10, 12, and 18-inch power trimmers.

Circle (711) on reader card for a copy.

Denver Trees Suffer From 'Gastric' Ailment

Denver's elms, cottonwoods and poplars can suffer from a gastric ailment known as wetwood, according to city forester George Stadler.

The non-infectious malady, not to be confused with Dutch elm disease, can be arrested and cured, Stadler reports. Bacteria causes carbohydrates and other tree materials to ferment and produce gas. Abnormally high sap pressures build up inside the tree trunk as the result. Up to 60 pounds per square inch have been recorded, Stadler reveals.

The pressurized sap, which produces a water-soaked condition, seeks the nearest escape route—cracks in the trunk or any other opening. Wilting of branches and twigs may also occur.

Stadler explains that holes are bored into the heartwood of the tree and pipes are inserted to drain off the sap to remedy the situation.

Meeting Dates

Northern California Turfgrass Council, Club House, Wil-
low Park Golf Course, Castro Valley, Calif., Apr. 7.

Florida Turf-Grass Trade Show, Florida Turf-Grass As-
sociation, Robert Meyer Motor Inn and Tangerine Bowl,
Orlando, Fla., Apr. 23-25.

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

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

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

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

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

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

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

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

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

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

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

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

CROWN VETCH

Controls Erosion — Zero Maintenance
NO MOWING! NO WEEDING!

Now faster, surer, easier with plants in
Peat-Pots. Also available as Crowns

Write for price information and brochure

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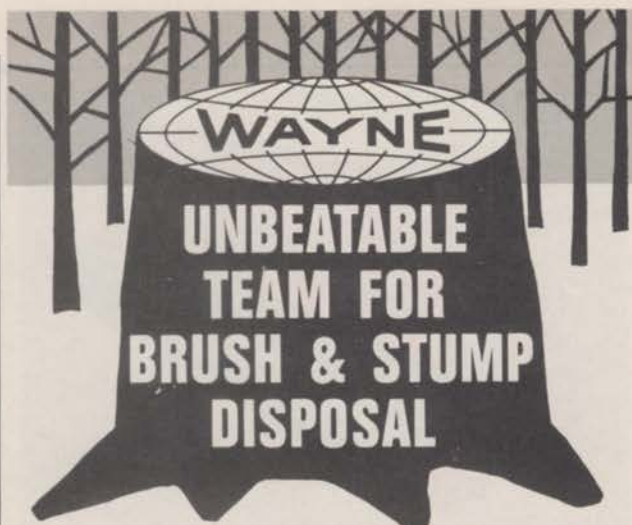
P.O. Box 230 — Plymouth Meeting, Pa. 19462
215-825-1240

or

P.O. Box 366 — Buffalo, N.Y. 14240
716-825-3300

For More Details Circle (106) on Reply Card

WEEDS TREES AND TURF, April, 1969



WAYNE BRUSH CHIPPERS can solve your brush
disposal problems with high speed and economy . . .
economy provided by exclusive 6 sided bed knife adding
50% more life than a conventional 4 sided knife.
Multiple safety features assures maximum protection
for your operating personnel.



WAYNE STUMP KING removes stumps in minutes,
even when they are 5 feet or more in diameter — cuts
down to 24" below ground level. Easily maneuverable
and features dial-controlled cutting speeds. Stump
King goes right to work with no wasted set-up time.

Write for money saving details:



1201 E. Lexington Street • Pomona, California 91769

SALES, PARTS & SERVICE WORLDWIDE
For More Details Circle (113) on Reply Card



— the most precise grass seeder made

Brillion's new Turf-Maker is for you — if you want to seed the finest grass seeds and lawn mixtures with miserly accuracy over large areas. It crushes, seeds and rolls in one pass—enables one man to seed up to 50 acres per day without extra help, equipment or seedbed conditioning.

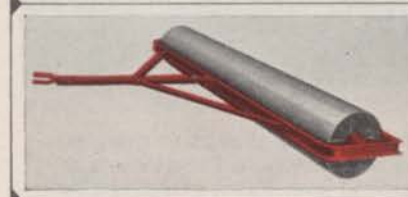
Turf-Maker gives you exclusive Micro-Meter adjustment for an infinite range of seed settings — Brillion fluted rolls, the most accurate seeding mechanism known — and the unique reversible sprockets for a dual range of rate settings. The results: Full, thick stands at up to 50% seed savings over conventional methods. It's the best for sod seeding.

You can order Turf-Maker in 8' and 10' seeding widths. Options include transport wheels for both sizes and 3-point Category II pick-up for the 8' model. Seed better — save more with Brillion. Mail coupon.



NEW FERTILIZER BOX KIT

— for 5'4" pick-up Landscape Seeder. Holds 230 lbs. of granulated fertilizer and can be set to broadcast at 25 to 200 lbs. per acre while seeding.



SMOOTH ROLLERS

— for smoothing humps and winter heaves in established turf. Single and triple gang models, 9' to 20' widths.

Landscape Tools with a Future—for You!

BRILLION IRON WORKS, INC.

Dept. 15-59-4, Brillion, Wisconsin 54110

Please send me information on the following:

- ☐ New Turf-Maker ☐ Smooth Rollers
☐ Landscape Seeders ☐ Name of nearest Brillion dealer

Name.....

Address.....

City.....State.....Zip.....

15-98

Insect Report

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

TURF INSECTS

AN ARMORED SCALE

(*Aonidomytilus bilobis*)

CALIFORNIA: Medium on *Artiplex* sp. in Kettleman City, Kings County.

INSECTS OF ORNAMENTALS

A NOCTUID MOTH

(*Orthosia hibisci*)

MARYLAND: Larvae lightly damaged rose buds at University Park and Greenbelt in Prince Georges County.

FORBES SCALE

(*Aspidiotus forbesi*)

FLORIDA: Found on dogwood, *Cornus florida*, at Williston, Levy County. This is a new Florida Department of Plant Industry county and host record.

GRAPE SCALE

(*Diaspidiotus uvae*)

VIRGINIA: This species and *Chionaspis parkii* (an armored scale) infested about 10-15 percent of sycamore trees in nursery at Portsmouth, Norfolk County.

PINEAPPLE SCALE

(*Diaspis bromeliae*)

CALIFORNIA: Medium on pineapple plants in a nursery in Kenwood, Sonoma County.

BLACK VINE WEEVIL

(*Brachyrhinus sulcatus*)

OREGON: Severe on two large beds of ornamental maple rootstock in Portland, Multnomah County. Trees in small pots; grubs averaged 4-5 per pot.

TREE INSECTS

AN APHID

(*Cinara pilicornis*)

MARYLAND: Found on hemlock near Glen Burnie, Anne Arundel County. This is a new State record. Heavy on spruce at a home in Baltimore, Baltimore County. This is a new county record.

SOUTHERN PINE BEETLE

(*Dendroctonus frontalis*)

ARKANSAS: Detection flights made in Ashley County. Sixteen spots of dead timber observed. First record of this species in State since 1913.

SILVER-SPOTTED TIGER MOTH

(*Halisidota argentata*)

CALIFORNIA: Larvae damaging pine trees in Pacific Grove, Monterey County.

PALES WEEVIL

(*Hylobius pales*)

ALABAMA: Adults feeding on 1 to 2-year-old pines in 10 to 15-acre planting in northwest Chambers County.

WEEDS TREES AND TURF, April, 1969

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

USED EQUIPMENT

SPRAYERS, 4 Meyers 6395-2E010, Special 89 inch tank, M7 pump, Wisc. engine, skid mounted; 1, John Bean V100 mounted on good 1957 Ford; 1 Meyers like above mounted on 1952 Ford. All 6 units equipped with booms, controls, etc., meeting Missouri Highway equipment requirements for right-of-way spraying. New cost in excess of \$30,000. Take them all and we will throw in 5 transfer pumping units, 6—1,000 gallon nurse tanks, miscellaneous hose, etc., all for \$10,000 cash. Will finance qualified parties. C. L. Lipscomb, Kelcomton Chemical, Box 3555, Springfield, Missouri 65804. Phone UN 2-5188, Area 417.

FOR LEASE: All the above equipment listed for sale may be leased at a monthly rate of \$200 per month, five-year minimum lease. Contact Kelcomton Chemical Company, Box 3555, Springfield, Missouri 65804.

HIGHWAY WEED-BRUSH sprayer, Hardie 1000-gallon R. S., 25-gallon min. pumps, custom built, spray boom right or left hand. One man operated, all controls inside cab. Can spray 8-10 miles per hour. Complete, mounted on International 1967 2-speed, special truck. Terms: Cash. Ray E. Goodell, RD 1, Conklin, New York 13748.

1-1200 DYNAFOG fog machine, used less than 100 hours, excellent condition, \$750.00. 1—John Bean, model 75 mist blower, very good condition, skid type, \$600.00. United Tree Service, 111 N. Church, Byron, Michigan 48418. Phone 313 266-4363.

FOR SALE — Used Skyworker on a 1960 Ford truck, 42' boom, rebuilt motor, air compressor, air power tools, good condition, \$6,500.00. Phone 216 875-5734, Louisville, Ohio.

HELP WANTED

HORTICULTURIST, Education equivalent to college degree in Park Management, Horticulture, Landscape Architecture or Forestry and three years professional experience including one year in supervisory capacity. \$7,920 to \$9,900. Send resume to H. Dressler, Superintendent of Wilmette Park District, Gillson Park, Wilmette, Ill. 60091 prior to April 15, 1969.

WASHINGTON STATE licensed spray operator. Salary commensurate with ability. \$6,000 to \$8,000 per year. Future advancement. Write: Green-Up Spray Service, 12437 First, S.W., Seattle, Washington 98146. Phone 206 242-4720.

FOR SALE

IN NEW YORK STATE. Prime Tree Spraying Business located in Westchester County, New York, established 20 years ago. Gross volume

of approximately \$50,000 to \$60,000. (with a potential of many times this amount) is done in less than a seven month period, with a payroll of only \$10,500, plus considerable tree surgery work that is referred to other companies. There is more than \$40,000 in equipment which ranges from office machines to 600 gal. hydraulic sprayers. Also included is a modern 2-way radio network. This operation nets into five figures, plus other valuable considerations for its owner, who is selling because of other business activities. Priced for a quick sale at \$35,000 or would consider selling the business and equipment separately. Terms arranged. List of inventory mailed on request. Mail inquiry to Mr. H. G. Widmark, Pres., Widmark Scientific Control, Inc., Draw 151 Harrison, New York 10528.

Nurserymen Make Available New Safety Presentation

"A Rabbit's Foot Is Not Enough" is the title of the new 16-minute 35mm slide presentation on accident prevention now available from the American Association of Nurserymen.

The safety presentation shows nurserymen how insurance costs

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Hypro, Inc.	11
International Harvester Co.	22, 23
Jacklin Seed Co.	42
Kem Manufacturing Corp.	29
Mitts & Merrill, Inc.	5
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John Nunes Mechanical	
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Nursery Specialty Products Co.	17
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Shamrock Turf Nurseries, Inc.	33
Stanford Seed Co.	39
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can be reduced by using safe working procedures, reviewing safety programs, investigating job applicants and enforcing good housekeeping. It reveals how just 7 accident claims cost the AAN-approved Workmen's Compensation Plan \$42,700.



"I got chewed out for not coming to you sooner about my weed problem."

NO UGLY seed heads

with



**FYLKING
KENTUCKY BLUEGRASS**

In spring most lawn grasses sprout green and beautiful turf. Then an ugly problem arises. Seedheads begin to appear with gypsy abandon, turning the green scene into a jungle of wiry straws even sharp mowers fail to sever. This wire-like growth remains an eyesore.

You can always survey your lawns with pride if you grow 0217® Fylking Kentucky bluegrass. Fylking shoots up a spring abundance of new green leaves, never produces wiry stems and ugly seedheads. This sensation of the sod and seed industry is low-growing, always mows smooth and thrives on close cutting. Fylking produces thicker, greener turf which is more disease, weed and wear-resistant than any variety yet (proven by 10 years of international testing — rated best obtainable by turf authorities).

Turf-forming qualities make it possible to lift sod in 110 days.

You'll never have ugly seedheads if you specify 0217® Fylking Kentucky bluegrass. See your seed distributor. For information or names of authorized distributors, write Jacklin Seed Co., Dishman, Wash. 99213.

For More Details Circle (112) on Reply Card

Potable Water Treatment

(from page 11)

erratic drift towards deeper water despite any visual evidence of water movement. Weed kill within the drift affected lanes was incomplete until approximately 30 days, but clearance of the deep water sections was more rapid.

5. Complete "dieoff" of elodea was not achieved except in the central portion of a large test area treated with Diquat applied at the rate of 1½ gallons per surface acre. Clearance in the central area was attributed more to increased effectiveness of large scale applications than to the use of pure Diquat.
6. Re-infestation of the treated areas within two years can be anticipated if the present phytoplankton population levels decline to the levels of pre-treatment.
7. Coontail (*Ceratophyllum* sp.) may act as a replacement species for elodea, perhaps becoming as much of a nuisance as elodea in previous years.

IT'S RENEWAL TIME !!

Your Annual Renewal Notice Card is bound in above. Please give this your immediate attention.

In order to continue your free subscription to WEEDS TREES AND TURF magazine, it is a requirement of our national circulation auditing service that we annually reverify (to their satisfaction) who you are and what you do. This is necessary since only certain select types of recipients are permitted to receive WEEDS TREES AND TURF magazine at no charge to themselves. Any information on the card above is strictly confidential and is used only to determine your eligibility to receive WTT at no charge. We ask you to fill out the card and return it to us now in order to keep your subscription current. Thank you.

Trimmings

NEW GRASS VARIETIES. A number of new grass varieties are being readied for the market. Several were discussed at the just completed Midwest Turf Conference at Purdue and we'll report fully on them next issue. Among these are Sodco which is being promoted by the Agricultural Alumni Seed Improvement Association of Purdue. Prato was discussed by Howard Kaerwer of Northrup-King, Fylking by Doyle Jacklin of Jacklin Seed Company and Warren's A-series by Ben Warren. Warren announced a new low-cut bluegrass, A-29, which is new to the industry. Besides these, Kentuckians are promoting Kenblue and Washington State has released Cougar.

* * *

ALLIGATOR WEED BEETLE. An Argentine beetle is doing a good job to date in checking alligator weed in California. Dr. Richard D. Goeden of the University of California, Riverside, reports that the beetles have kept the weed stripped of leaves at Whittier Narrows dam. Called Agasicles, the beetles were first released in 1967. The original 2000 have now multiplied to hundreds of thousands. Goeden says the beetles do extensive damage and curtail spread but he doubts they can eradicate alligator weed.

* * *

TOUGH TREES. Tree seedlings are being fumigated with air pollution agents at the University of Pennsylvania. The idea is to pick the survivors over a period of generations and multiply them for city street and highway use. They will replace many of the sensitive varieties now in use. Work is being done by Dr. Henry D. Gerhold. He is subjecting the new trees to sulfur dioxide and ozone.

* * *

POISON IVY SEASON. We just read a precaution about how you can pick up poison ivy rash without touching the plant. We who have burned brush have known this for a long time, or since we burned the first brush containing stems, roots, leaves, or berries of the plant. Actually, smoke from the burning plant can be more dangerous than the plant itself. Poisonous oils produced by the plant, according to the technical data, go up in smoke. And if this smoke contacts the skin or is inhaled, there will be irritation. This is usually true even for those lucky people who are resistant. Best bet is to kill it with a herbicide, and then bury the residue.



More smiles per acre

...with complete Velsicol chemical care

Thick, smooth, green-carpet turf—with no beauty-marring blotches and bald spots—makes happier visitors, members and bosses, or better-satisfied customers.

And you turn on more smiles per acre—easier—with advanced Velsicol job-tailored chemicals. Modern Velsicol chemicals give you

precise, thorough control of almost every troublesome weed, insect or disease. They're performance-proved—in the laboratory and on toughest turf jobs.

Whatever your turf problem—grounds, parks, golf courses, or sod farm—you can depend on the big Velsicol family of advanced chemicals for the "right answer." With more and bigger built-in smiles! For extra convenience just call your Velsicol

supplier. Ask for Velsicol herbicides, insecticides, fungicides, fumigants—*everything* you need to lick practically any turf enemy! You'll enjoy one order, one shipment, one invoice convenience... plus the added assurance of *complete* Velsicol care.



Complete line of quality turf chemicals from



THE GROWING WORLD OF
VELSICOL

Write for Velsicol Turf Chemicals Catalog:
Velsicol Chemical Corporation, 341 E. Ohio St., Chicago, Ill. 60611. Dept. WTT-49



Untouched by human hands...



New Ryan "Sulky Roller" attaches to Ryan Sod Cutter . . . rolls over 10,000 yards per day.

This is NEW from Ryan. The new Ryan Sulky Roller makes your Ryan Sod Cutter the most versatile, labor-saving machine you can own. The Sulky Roller attachment allows one operator to ride, cut, mark to any length, roll and turn rolls from the cutting path . . . ALL IN ONE EASY OPERATION.

The Ryan Sulky Roller attaches quickly and

easily to your Ryan heavy duty Sod Cutter with six bolts into six existing holes. It operates efficiently in all soil conditions. The single operator can harvest over ten thousand yards of sod per day.

The price of the new Ryan Sulky Roller attachment is less than \$800. It is fully guaranteed and covered under the warranty of your Ryan Sod Cutter.

Boost your sod production



AUTOMATIC SOD ROLLER
produced by Ryan rolls sod forward and lays it to either side for easy pick-up.



RYAN SOD HARVESTER
enables two men to cut, roll and palletize thousands of yards of sod per day.



TURF EQUIPMENT

2055 White Bear Avenue
St. Paul, Minnesota 55109