

MARCH, 1969

WEEDS TREES and TURF



New Automatic System

Turf Mulches

Defoliation

special irrigation issue

when your season rolls around...



be ready to roll with a NUnes sod harvester

PATENT APPLIED FOR

NEW MACHINERY

Designed by John Nunes to help Sod Growers improve their operation, will be unveiled in our next advertisement in Weeds Trees & Turf.

WATCH OUR ADS!

- With a NUnes Sod Harvester and three men you can lift, cut, roll and palletize up to 1200 square yards of sod per hour.
- The harvester, developed at NUnes Turf Grass Farms in California, is designed to handle any length of rolled or slabbed sod.
- Field grading of sod is done by the tractor operator, who has clear visibility at all times.
- Hydraulic controls permit quick and easy adjustment for all conditions.
- The sod harvester travels alongside, never on the turf, during harvesting and can pick up and roll sod at any time your tractor can operate in your field.
- Sod can be cut with any type of sod cutter. The long ribbons can then be lifted and cut to any desired length from 24" to 90", size depending on thickness of sod.
- Loaded pallets can be spotted for later field removal and be clear of the next harvest run. If direct truck loading is desired, a conveyor extension is available.
- The basic power train is a Ford LLG-2110 wheel tractor. The sod harvester can travel at speeds up to 17 MPH for quick transportation between plots.
- The efficiency of this all-mechanical operation has been proven on NUnes Turf Grass Farms in Patterson, California, and it can solve the problem of quick and economical harvesting of sod by all turf farmers.

For more information please contact:

THE JOHN NUNES MECHANICAL HARVESTING CO.

2006 Loquot Avenue, Patterson, California 95363, Phone (209) 892-8776



For More Details Circle (117) on Reply Card

WEEDS TREES and TURF

March 1969
Volume 8, No. 3

FORMERLY WEEDS AND TURF



The Cover

The first nine holes of Lake Oswego's (Ore.) 18-hole municipal par-3 course opened for play in November, 1967.

The final nine is now completed with play scheduled to begin this spring. A strong feature considered mandatory during the planning stage was an automatic irrigation system, shown in operation on this month's WTT cover. Story on page 6.

More Chemicals Used For Aquatic Weed Problems

The use of chemicals to control excessive growth of algae and aquatic weeds in lakes has become more widespread in Wisconsin in recent years, reports M. Starr Nichols, researcher with the University of Wisconsin's departments of agricultural and civil engineering.

From 1950-58, eighty-one Wisconsin lakes received treatment of about 78,000 pounds of sodium arsenite per year, while 41 lakes were treated with 671,964 pounds of copper sulfate, according to Nichols.

During the past several years, the number of lakes chemically treated has continued to grow. In 1966, Nichols cites, 150 lakes in the state received the following treatments: 48 with copper sulfate for algae control; 16 with sulfate-copper carbonate for swimmer's itch control; 38 with sodium arsenite; and 37 with organic chemicals such as diquat and 2,4-D for weed control. Sixteen of those lakes needed more than one treatment; one lake required 13.

Features

Lake Oswego's New Municipal Course—Automatic Irrigation System	6
Locate Water Supply—New Development Helps Spot Underground Sources	8
Comparing Mulches By L. E. Foote and D. L. Kill	12
Bacterium Curbs Tree Defoliation By Tussock Moth Caterpillar	19
Viet Nam Herbicide Program	20
Leading Turfgrass Show—40th Meeting of Golf Course Superintendents	23
Sod Industry Survey	36
Growers Tour Florida Sod Farms—2nd ASPA Annual Meeting	41

Departments

Editorial: This Means You!	4
New Products	44
Insect Report	46
Classifieds	47
Advertisers Index	47
Trimmings	48
Meeting Dates	4th cover

President and Publisher
Hugh Chronister

Editor and Editorial Director
Arthur V. Edwards

Managing Editor
Donald D. Miller

Editorial Assistant
Kathy S. Thomas

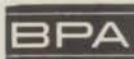
Vice President Advertising
Dan M. Humphrey

Director of Circulation
Roy Bever

Advertising Production
A. J. Michel

Advertising Sales Offices:

National Headquarters—9800 Detroit Ave., Cleveland, Ohio 44102, 216+631-6468; **Chicago, Ill.** 60601—333 N. Michigan Ave., 312+236-9425; **Shawnee Mission (Kansas City), Kansas** 66202—6811 W. 63rd St., 913+722-5900; **New York City** 10017—757 Third Ave., 212+421-1350; **Harrisburg, Pa.** 17105—2436 North Second St., 717+234-3086; **Columbus, Ohio** 43212—1350 W. Fifth Ave., 614+486-9638; **Lansing, Mich.** 48906—4415 N. Grand River, 517+372-5254; **Los Angeles, Calif.** 90005—The Eschen Co., 3142 Wilshire Blvd., 213+382-8391; **San Francisco, Calif.** 94104—The Eschen Co., 57 Post St., 415+781-7440.



**Member
Business Publications Audit**

WEEDS TREES AND TURF is published monthly by The Harvest Publishing Company. Executive, editorial: 9800 Detroit Ave., Cleveland, Ohio 44102.

Single Copy Price: 50 cents for current issue; all back issues 75 cents each. Foreign \$1.00.

Subscription Rates: WEEDS TREES AND TURF is mailed free, within the U.S. and possessions and Canada, to qualified persons engaged in the vegetation care industry and related fields in controlled circulation categories. Non-qualified subscriptions in the U.S. are \$7.00 per year; Canada and other countries, \$10.00 per year. Controlled circulation postage paid at Fostoria, Ohio 44830.

© The Harvest Publishing Company, 1969

If you are an upstanding citizen who has never contacted a congressman or state legislator, now is the time to make their acquaintance. Either the pesticide industry—and everyone connected with it—mobilizes now, or it can find business unnecessarily restricted.

Last month we mentioned that DDT was on trial. It is. Consider the pending legislation: Illinois—House Bill 81 introduced January 22 proposes to prohibit sale or use of DDT. An earlier Illinois watershed bill specifies that it be “. . . unlawful to use or dispose of any persistent pesticide in such a manner or in such a location that it is likely to flow into the watershed of Lake Michigan.” Persistent pesticide is defined in this Illinois bill as “any pesticide composed of or containing any of the following: aldrin, chlordane, DDT, dieldrin, endrin, heptachlor or lindane.”

Connecticut: Introduced January 14, 1969, a bill to prohibit the distribution, sale, delivery or use of DDT in that state. The bill proposes that the chemical may be used only as a public health measure in emergency situations and under the direction of the commissioner of health.

Maine: Bill similar to Connecticut was intro-

duced January 15, 1969 and would prohibit sale or use, but does not contain the emergency measure. Minnesota: Bill to prohibit sale of economic poisons containing DDT was introduced January 17, 1969, At least two additional states are expected to receive proposed legislation this session.

In no case to date have the penalties called for in the bills been severe. But penalties are not the issue.

Should bills be passed in any of these or other states, the door is open to amendments to include other chemicals for uses wholly unrelated to the DDT problem. Legislators, both state and federal, need all the informed thinking available on this subject. You, regardless of your position in the pesticide industry, need to contribute. You can call, wire, write, or visit the people who represent you.

As for the case of DDT, existing federal controls protect man and his food. Little evidence can be found concerning DDT injury to man. Wildlife which we all appreciate is the sole area of contention. We need more study and more solid information before legislation. Let's make sure that the case is tried on its merits rather than emotion.

April

WEED & BRUSH CONTROL PLANNER



Timing Is Everything

Not only the time of the year. How many times is important, too. Do you ever feel you're spraying the same weed year after year? If you're spraying the same chemical, you probably are. April is the time to "spike" your present chemicals to get a more thorough kill.

Think Economy

Fenac® and Amizol® will hold out the weeds that your present chemical is probably missing. Add either one to "spike" your present chemical. They add so much that you can lower the rate of your high dollar chemical. That savings will be enough to pay for them. And you won't see the same weeds year after year.

What to Use in April

In the South your problems are vines and Johnson grass. In the North, late germinating crab grass and pigweed flourish. 3 gallons of Fenac® per acre added to your chemical will kill them for this year. One more spray either this year or next will put enough Fenac® in the soil to eliminate all traces of them. The systemic, translocating chemical Amizol® added at 3 to 6 lbs. per acre will kill tough perennials such as milkweeds, dogbane, Equisetum and all types of grasses in the West, mid-West and Northeast. Get a more thorough, less expensive kill with the twin herbicides, Fenac® and Amizol®. The time is now.

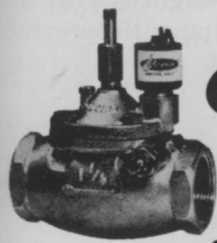
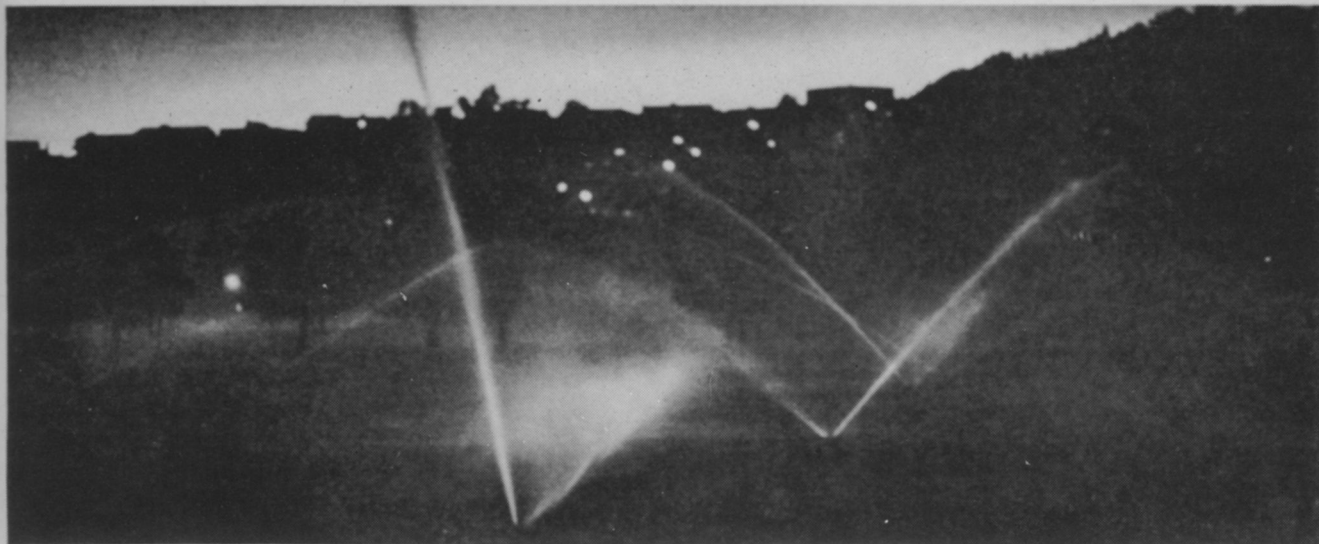
First name in herbicide research



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

AMCHEM PRODUCTS, INC., AMBLER, PA.

For More Details Circle (118) on Reply Card



***Our valves
come on strong under
all kinds of pressure***

The mark of the professional is reliability. No matter what the pressures. No matter how tough the terrain. And, that's our 150GER Series Electric Automatic Valves with Pressure Control. The Professionals. They'll never let you down.

Our 150 GER's were specially designed and meticulously engineered to hold pressure constant to all sprinklers. Regardless of varying elevations. Regard-

less of water line lengths. Regardless of inlet pressure fluctuations.

Available in five angle or globe sizes—1", 1 $\frac{1}{4}$ ", 1 $\frac{1}{2}$ ", 2" and 3"—you'll stay steady, day and night, with the 150GER. Get more facts on the 150GER and the entire line of Buckner equipment from your Buckner dealer. He's equipped to give professional solutions to professional problems.

**Buckner**[®]

Buckner[®] Sprinkler Co. Division of General Sprinkler Corporation, P. O. Box 232, Fresno, California 93708

For More Details Circle (108) on Reply Card



Lake Oswego's New Municipal Course

Automatic Irrigation System

CITY golf courses owned by small municipalities are common. But few feature an automatic irrigation system for turf maintenance as does the new municipal course at the City of Lake Oswego, Oregon.

Work crews of the City handled all phases of construction. United Pipe & Supply Co., Inc. of Portland designed and sold the irrigation system. Total cost which included remodeling of an old 2-story farm equipment storage building as a pro shop and building of a new equipment and maintenance building amounted to only \$175,000 exclusive, of course, of land. Funds came from a continuing 2-mill tax levy established by city voters in 1949 for parks and recreation. The levy in the City of about 15,000 produces about \$180,000 annually.

Work on the course began in April, 1967. First play on the initial nine holes was on November 25. The back nine was construct-

ed during 1968 with play scheduled to begin this spring.

Course Self-Supporting

City Manager Deane Seeger believes that with opening of the full 18 holes, and based on '68 income from the first nine, that greens fees and driving range revenues will place the course on a self supporting basis by mid-summer of this year.


United Pipe & Supply representative, Roy Falk, said the system on the modern course consists of 3 to 5 sprinklers per green, with a 2-row system on fairways. During irrigation, one row is operated at a time, which the City water pressure will handle. Pressure varies from 70 up to 90 pounds.

Falk reports that United used Buckner #1371 sprinkler heads on fairways and #1330's on the greens. The course is solidly irrigated in front of the club house because of heavy use.

Approximate cost of the irrigation system equipment, less installation by City crews, on the 33-acre course was \$20,000. The course was designed with help of a local equipment representative consultant.

Wilber Freak, left, grounds superintendent at Lake Oswego course, and Roy Falk, United Pipe & Supply Co., Inc., Portland, Ore., discuss automatic system.





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.*

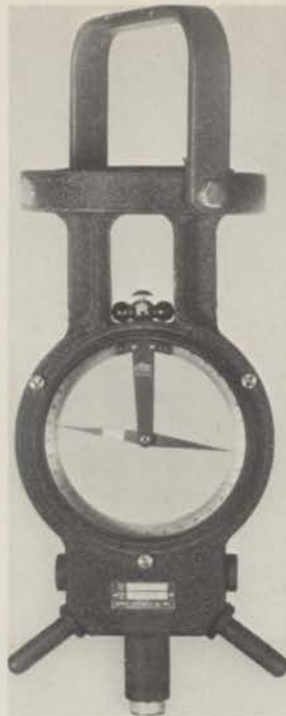


Complete line of quality turf chemicals from



THE GROWING WORLD OF
VELSICOL

Write for Velsicol Turf Chemicals Catalog:
Velsicol Chemical Corporation, 341 E. Ohio St., Chicago, Ill. 60611. Dept. WTT-39



Aquatometer

In Brief:

Irrigation water in many areas is difficult to obtain, if not impossible. Any method which will aid turf care professionals in their search for irrigation water, as well as a supply for other uses can prove a valuable asset. WTT asked the president of Accurate Water Location, George L. Jamieson, to present his experiences with a new water magnetometer which he has used successfully, and which he subsequently developed as a service available to both industry and individuals.

New Development Helps Spot Underground Sources

Locate Water Supply

By George L. Jamieson
President, Accurate Water Location, Inc.

BELIEVE it or not, there is a way to locate water accurately!

We have been so long accustomed to the uncertainties in finding reliable water supplies that most builders, grounds superintendants and construction engineers still despair when the problem comes up.

For years there has been this dilemma: where to drill to obtain the most water at the shallowest depth? And for centuries—all types of artistic witchcraft have surrounded this essential search of man. Willow and peach twigs, divining rods, coat hangers, witches and just plain

hunch have called the tune. And those paying the piper have lost countless dollars (and substantially more sleep!) in drilling dry wells.

Clearly, drilling a well has many hazards and can be an expensive gamble. Knowledge of an area from drilling nearby wells or from geologic surveys or hydrologists has often been helpful. But despite this help, the gamble is still high, because of the complexity of pin-pointing heavy water incidence in earth fractures deep—or not so deep—beneath the surface of the ground.

Today, however, proven help

is available. A new water magnetometer has performed so well to date that several people throughout the country have become franchises on this instrument. We call it the "Aquatometer."

Predicts Flow Rate

There is no magic in locating water in many water-rich areas of the United States. But in others—in my own area of New York State, for example—it is quite a trick to do three things: locate water, predict its depth and determine its rate of flow. The new "Aquatometer" we

have been using, primarily in the Northeastern States, has an enviable record of success. The people served by Accurate Water Location and its new instrument tell us we have taken the witch out of well-witching, the doubt out of dowsing.

Where we have been most successful with this instrument is in areas where costly, waterless wells have been drilled — in short, where water is difficult to find.

The instrument has an intriguing history. Basically, it is a mining instrument although when the time came for Kenyon Instrument, the inventors of the device, to market it they found that there was no one who was interested in it for prospecting. The instrument was costly, and if anyone found minerals with it there wasn't much market for the minerals. Through experimentation, it was found that the instrument was reading something else besides minerals, because in New York State we do not have an abundance of copper, gold and silver. The company decided that what the device was sensing might possibly be water; over a period of several years people who had had unusable wells drilled asked for the use of the instrument. The company had substantial success, but was not really sold on the use of the instrument for locating sources of water.

In 1965 I had a problem: where to drill a well? Mine was surely going dry. Since I had no knowledge of where to drill another well, through an article about the invention I became interested and investigated it. Little did I realize that a short three months later I would own the patents. My own well came in at the amount and depth that the instrument indicated, but with just a smidgin of error, proving that we can't be absolutely perfect. As a matter of fact, we do have our failures and often we don't know why. Many times



Aquatometer being used to locate water supply at new school site. Transporting instrument is Dick Jamieson and checking plot map is George (Hap) Jamieson, both experienced men in using the water magnetometer.

we are not present when the well is drilled; thus, we don't know how the well was drilled or if the driller was competent. It might even have been our fault because of insufficient knowledge of the area. We are not always supplied with local history to make proper judgment

or allowed enough time to make proper evaluation.

How Magnetometer Works

The basic theory behind the new magnetometer is not too complicated. What the instrument senses beneath the ground,

as we walk over the land with it, is the ionized stream of water underground, variations in the earth's magnetic field — and the imbalance in water distribution in a given area. Properly evaluated, these factors can mean water — at specific depths and in specific quantities.

Why should you be interested in this new concept of looking for water? Water and often lots of it must be supplied for every living thing we know of and often is just not available. The problem is not only to find it, but also in the quantity that is needed. What is a large volume well for one problem is completely unusable for another. A 200 gpm well for a golf course would be fine, but for the farmer wanting to irrigate, it wouldn't pay to put a pump in it.

Let's take the golf course problem first, since turf and greens consume great amounts of water. The difference between a watered fairway and a burned out one in August is dramatic. Before my own club put in watered fairways, I hit my share of shots off of hardpan and I can say that I much prefer the watered grass. My club was lucky and drilled two excellent wells blind. Still, two years ago they ran out of water in September and decided to tap into the city water to be sure of an adequate supply.

In many cases city water is not available or cannot be used because of a limited supply, as was the case of New York City during the drought. The courses in Westchester County were told that they could no longer use city water for fairways and, I believe, not even for the greens at the height of the drought. At that time I was called in by Winged Foot Golf Club to check specific areas for the possibility of drilling wells and had to tell them that the probability of finding wells in the 50 gpm range was almost nil. Fortunately for them, the restriction was removed shortly afterwards.

A short time later the Powelton Club, Newburgh, N.Y., decided to put in a fairway irrigation system. We were asked to locate the best source of water for this system with the emphasis put upon a primary area. We located a site in this area which did not produce the amount of water necessary because the depth of the gravel was too shallow. Another area was determined by instrument as a good source both because of the readings and also because of the possibility of a major fault put forth by a state geologist. The readings indicated water in gravel and a well was drilled into 25 feet of gravel. The gravel was very tight and would not develop. It was decided to drill into the rock; production wound up at 15 gpm. We then advised the club to drill about 50 feet away and try to develop the gravel. The well came in at 160 gpm without development. (In another case where we have not yet been called in, a club has already spent \$10,000 on wells with a total yield of about 25 gpm. Both the driller and several club members had recommended that we be called in to make a search. It never ceases to amaze me that so many people will spend so much money to obtain so little water.)

While we do not have the experience on gravel aquifers that we have on rock, we feel that the magnetometer can tell us a great deal about the flow of water through gravel. People involved with large irrigation wells tell us that they find these large wells by simply sinking test holes until they find one that indicates it will produce the desired amount of water. This is time consuming and sometimes quite expensive. If the instrument does what we believe it can, it will be quite an asset to those people looking for large irrigation wells.

Over the last three and a half years, we have been able to

maintain an extremely high average of prediction on water quantity as a result of drilling on our selected sites. Our Vermont franchisee, Accurate Water Location, Waterbury, Vt., has an even better average in that most difficult state. We anticipate that our newest franchisees should do well. (They are in Northern California, Colorado, Nevada and Upper New York State.) More are expected this summer. Even now, we can and will cover anywhere in the United States and Canada.

Professionals are increasingly using our services. Only recently we conducted a search for the Taconic Park Commission, looking for a 20 gpm well for development of a camping area. We were able to locate a site that produced 112 gpm at 150 feet. We have now completed a second search for them and anticipate doing several others. Architects and engineers are finding that our services are helpful to their school, industrial and home owner clients.

As time goes on, we expect ever-increasing use of our practical magnetometer. Its record of 98 percent accuracy on water location and 85 percent on flow rates will be exceeded as more experience is gained with this proven water prospecting tool.

*Coming
Next Month
In WTT:*

Poa Annua
Herbicide Use In
Potable Supply
Thatch Removal
Weed Society Report

Mosquitoes are cheaper by the acre

When you compare costs per acre for adult mosquito control, you'll find one product always costs less. DIBROM® 14 Concentrate. Any size job. Ground or air. DIBROM 14 Concentrate gives you the lowest cost per acre.

DIBROM 14 is your best buy in adult mosquito control because it takes only a few ounces to get quick, thorough kill. Dilute it with oil for ground or air application. Or apply it by air at full strength with ultra-low volume equipment. (The plane might run out of gas before it runs out of DIBROM 14!)

For large-scale mosquito control programs, ULV application is

the greatest thing that's happened in years. Cuts insecticide costs way down. And ULV kit conversion for aircraft is quick and economical, too. (For maximum savings, check with your ORTHO man on bulk handling of DIBROM.)

And all this with the other advantages of DIBROM. Breaks down on contact with soil, plants or water. No record of loss to fish or wild life when used at recommended rates. Registered for use over pastures, barnyards and feedlots, and for use on many crops up close to harvest, so there's minimum hazard of residues on food and livestock products.

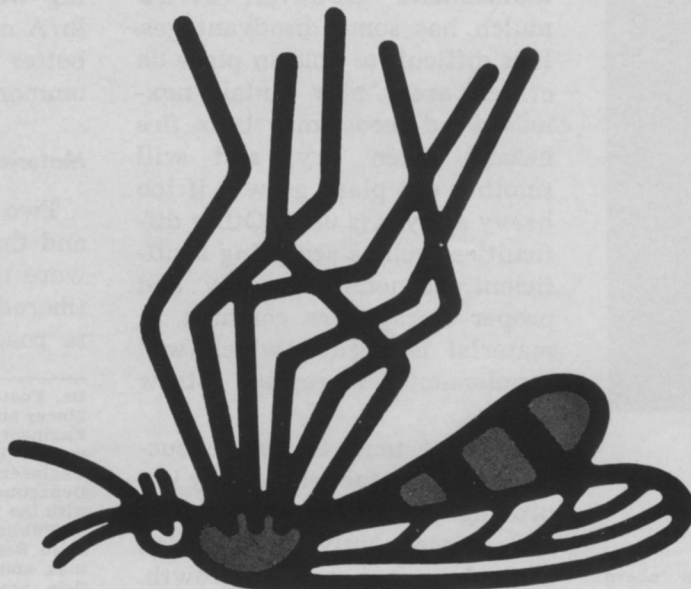
DIBROM is available also as DIBROM 8 Emulsive, for application in water by ground equipment, where

fogging or aircraft application isn't practical. (For either formulation, be sure to read and follow product label directions.)

And where every penny counts, use DIBROM 14 Concentrate ULV for quick kill of adult mosquitoes. And make every ounce count.

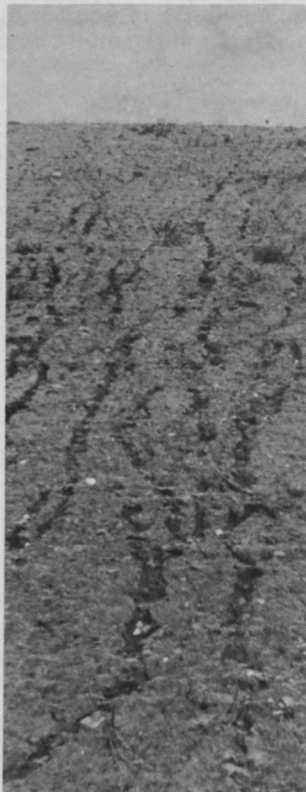


CHEVRON CHEMICAL COMPANY
ORTHO DIVISION
San Francisco, California 94120
Part of the great group of Chevron companies



DIBROM 14

For More Details Circle (107) on Reply Card



COMPARING MULCHES:

the long and short of it

By L. E. Foote and D. L. Kill
Minnesota Department of Highways

IN highway seeding work a critical erosion prevention period, usually 2 to 3 months in length, exists between seeding and the time a sufficient vegetative cover becomes established. Soil and seed may be lost during this time and the roadway, drainageways, slopes, and adjacent areas damaged. Mulches lessen erosion damage and improve turf establishment. Straw mulch tacked with asphalt is a widely used type. It often is effective in preventing erosion during turf establishment. However, straw mulch has some disadvantages. It is difficult to hold in place on critical areas, may contain noxious weed seeds, may be a fire hazard when dry, and will smother out plant growth if too heavy a layer is used. Other difficulties such as acquiring a sufficient, economical supply and proper storage are common. A material is needed which will supplement or replace straw mulch.

Mulches tend to assure successful turf establishment by improving moisture availability and, consequently, germination and subsequent seedling growth. Mulches encourage rapid moisture infiltration into the soil and because of better water infiltra-

tion, reduce water runoff and concurrent soil erosion. The more difficult the environment the greater the benefit from mulching.

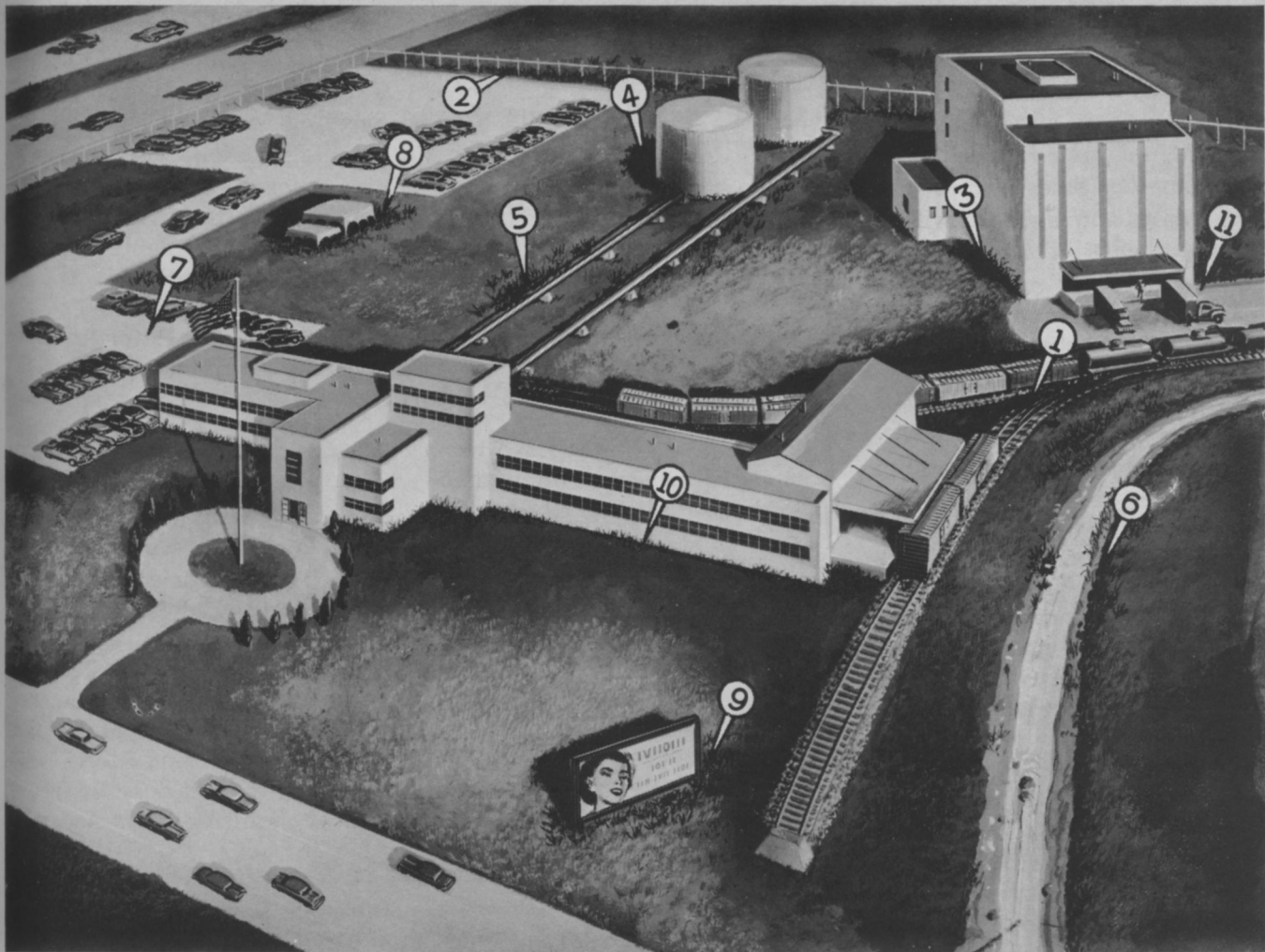
Wood pulp (as short-fibered mulch) has been found by some researchers to be equal to the conventional straw and asphalt combination (a long-fibered mulch) for erosion prevention and turf establishment. Other researchers have found that straw provides greater erosion protection than other mulches including wood pulp. A rate of 1400 lb/A of wood pulp was thought better than the sometimes recommended rate of 1000 lb/A.

Materials and Methods:

Two relatively long-fibered and three short-fibered mulches were tested. The standard long-fibered mulch used on Minnesota roadsides, straw plus an as-

Dr. Foote was formerly Agricultural Engineer and Mr. Kill was a Research Project Engineer, now Acting Director of Environmental Services and Acting Agricultural Engineer, respectively, Minnesota Highway Department. The work was in cooperation with the Department of Commerce, Bureau of Public Roads and the Minnesota Local Road Research Board. The opinions, findings, and conclusions expressed in this article are those of the authors and not necessarily those of the Bureau of Public Roads. The study is more thoroughly described in an interim report "Vegetation and Erosion Control" Dep. of Highways, State of Minnesota, 39 p., 1966.

Note erosion differences between above photos showing results of mulch applications: top, a plot protected by straw plus asphalt mulch 28 days after application; bottom, a plot in the same replication but protected by a wood pulp mulch. (Photos 1 and 2).



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."

For more information on Du Pont bromacil weed killers, clip and mail the coupon today.

With any chemical, follow labeling instructions and warnings carefully.



Better things for better living
...through chemistry

**Du Pont — Industrial and Biochemicals Dept.
Room N-2533-61, Wilmington, Delaware 19898**

Please send me more information on "Hyvar" X and "Hyvar" X-WS bromacil weed killers and other Du Pont weed killers.

Name _____

Title _____

Firm _____

Address _____

City _____

State _____ Zip Code _____

For More Details Circle (103) on Reply Card

phalt emulsion tack, was used as a "check" material (Treatment 1). A green wood excelsior fiber¹ (Treatment 4) was the other long-fibered mulch. This material comes in bales shaped like straw bales and is placed with a mulch blower. Three short-fibered wood pulp mulches, each made by a different manufacturer, were tested. One pulp² (Treatment 2) is about the same as paper pulp, i.e., it received the southern Kraft process treatment. The second wood pulp³ (Treatment 3) is produced from hardwoods using a mechanical grinding process which utilizes the whole pulp bolt. The third wood pulp⁴ (Treatment 5) used Douglas fir and was also produced by the mechanical grinding process. The manufacturers' recommended application rates are 1000 lb/A with up to 1500 lb/A being recommended for more difficult sites.

Research plots were located on highway fill slopes in the St. Paul, Minnesota area. Mulches were applied to 2 replications June 13, 1965 and to 3 replications July 20, 1965.

The short-fibered mulches were applied with a hydroseeder. The slurry contained seed, fertilizer and mulch. Pulps were applied at the rate of 1200 lb/A (Photo 3). After the plots had been seeded and fertilized with a hydroseeder, the 2 long-fibered mulches were applied with a mulch blower at the rate of 2 tons/A, and in the case of straw, also 200 gal. of asphalt emulsion.

The plots were seeded with Class 13 seed of the Minnesota Standard Specifications, 1964. This mixture provided the following minimum weights in pounds of pure live seed per acre: smooth brome grass (*Bromus inermis*), 9; white clover

(*Trifolium repens*), 3.5; Kentucky bluegrass (*Poa pratensis*), 10.5; timothy (*Phleum pratense*), 3.5; and perennial ryegrass (*Lolium perenne*), 3.

Two replications were on a clay loam which had been covered with 3 inches of loamy topsoil. One replication was composed of muck peat, and alluvial swamp material. The other 2 replications had a loam to silty clay loam soil covered with a loamy topsoil. All plots were tilled with a spring-toothed harrow and all rills were obliterated prior to seeding. The slope angle varied from 24 to 43% and the differences were not associated with treatments. The average slope was 33%.

Data were collected via line transects. Stakes were placed on the plot boundaries $\frac{1}{3}$ and $\frac{2}{3}$ of the distance from the upper edge of the plot. These stakes were used to mark line transect locations. The first 5 feet in from the end of each plot was considered border. The line transects were delineated with a heavy, semi-rigid steel tape which served as a "flexible" straight edge. The width of each eroded area was recorded to the nearest hundredth of a foot. The depth, distance from steel tape to the soil surface, was recorded for each eroded area. If the eroded area was greater than .3 foot in width, 2 depth measurements were taken. The depth measurements for each eroded area were averaged and this average depth x the measured width were used to calculate square area eroded.

Erosion measurements were taken over the entire transect length August 10 to 12, 1965. Seedling counts of all seedlings touching the tape were made every other foot along transect, September 8 to 10, 1965. Counts were of species planted, grassy weeds and broadleaved weeds. Cover, bare soil, desirable cover, weeds, and clover estimates were made by 4 estimators June 16, 1966. Built-in comparisons were: (1) long-fibered mulches vs. short-fibered mulches; (2) long-fibered mulch, straw plus asphalt vs. long-fibered mulch, wood excelsior not asphalt tacked; (3) processed wood pulp vs. non-processed (mechanically ground) pulps; (4) hardwood pulp vs. softwood pulp. The use of an upper and lower transect made it possible to evaluate the difference in erosion due to location on slope and possible interactions resulting from location

Table 1. Daily rainfall recorded at University of Minnesota weather station, St. Paul Campus (station about 1 mile from test site).

Date	Rainfall in Inches
July 13	.4
14	T*
15	T
16	.2
30	1.4
31	.2
August 3	.8
6	.4
7	.3
8	T

* T equals Trace.

Table 2. The effects of different mulch materials on erosion factors. See text for treatment materials.

Treatment	Soil Loss Tons/Acre*	No. of Eroded Areas per Linear 100 ft.
1	19.3*	5*
2	59.3	84
3	62.5	99
4	15.3*	15*
5	40.4	71

* Mean of long-fibered mulches significantly different from mean of short-fibered mulches, 5% level of probability.

¹ Manufactured by American Excelsior Company.

² "Turfiber"—Trade name for a product manufactured by International Paper Co.

³ "Conwed Hydro Mulch"—Trade name for a product manufactured by Conwed.

⁴ "Silva Fiber"—Trade name for a product manufactured by Weyerhaeuser Co.

on the slope and mulching materials. Thus the experiment was analyzed as a split block design with the upper and lower line transects of each replication being the major A plots and the mulch materials being the major B plots. The various data fields were analyzed via orthogonal single degree of freedom procedures where the differences between the built-in comparisons were tested for significance, 5% level of probability.

Results and Discussion:

Rainfall between the start of the study and the time of soil loss data collection is shown in Table 1. Total rainfall during the period was 3.7 inches.

Soil lost per acre was more than twice as great on plots mulched with the wood pulps than on plots protected by long-fibered mulches (Table 2 and Photos 1 and 2). The total width of eroded areas per lineal 100 feet was much greater for the wood pulp mulches than for the long-fibered mulches. Almost $\frac{1}{3}$ of the surface area of plots protected by Treatments 2 and 3 was disturbed by erosion. The major difference in erosion between the wood pulps and the

long-fibered mulches was the total number of rills or eroded areas (Table 2). The average width or depth of an eroded area was not a factor being about the same for all mulches. There was no significant difference due to transect location on the slope, top or bottom, and none of the interactions (slope position x mulches) were significant.

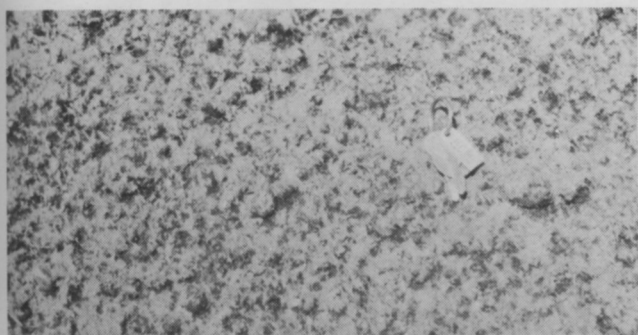
The long-fibered wood excelsior mulch proved to be as good as straw-asphalt mulch in preventing soil loss. The excelsior mulch has the advantage of not requiring asphalt tack. The mulch remained on the plots about 10 days prior to any rainfall. About the only hot dry windy days of summer, 1965 occurred during this time. The wood excelsior did not move. Since this mulch does not require asphalt tack it has an advantage over straw-asphalt in urban and residential areas and in use on roadways which are already carrying traffic (Photo 4). The danger of spotting buildings, houses, and cars with blowing asphalt is eliminated.

The number of grass seedlings occurring per linear foot was greater on plots protected by long-fibered mulches than on

plots protected by wood pulps (Table 3). Also there were a greater number of clover seedlings on plots protected by long-fibered mulches. There were no statistically significant differences in the number of broad-leaved weeds, grassy weeds and quackgrass plants occurring under the various mulches. When the growing cover under the various mulch types was considered on the basis of percentage contribution of the various plant types, the results appeared somewhat different (Table 3). The same differences regarding grass between the long-fibered mulches existed but Treatment 5 had a higher percentage than the other 2 wood pulps. The vegetative cover present under the short-fibered mulches (Treatments 2 and 3 but not 5) had a much higher percentage of broadleaved and grassy weeds than did the cover under the long-fibered mulches. There were no significant differences in plant counts due to transect location, top or bottom of slope.

No advantage in the use of excelsior mulch was detected with regard to the number of weed seedlings present. It had been thought that the use of mulch materials which did not naturally contain weed seed might reduce the weed population occurring on the roadside during turf establishment. Probably the soils encountered on roadsides already have such a high weed seed population that any effect from weed seed introduced by straw mulch would generally be completely overshadowed.

The significant plant stand effects due to the use of different mulches lasted only through the establishment year with one exception. The percent clover present in the long-fibered mulch areas was significantly higher than that present in the areas mulched with the wood pulps in 1966. The same trends regarding bare ground, cover, amount of

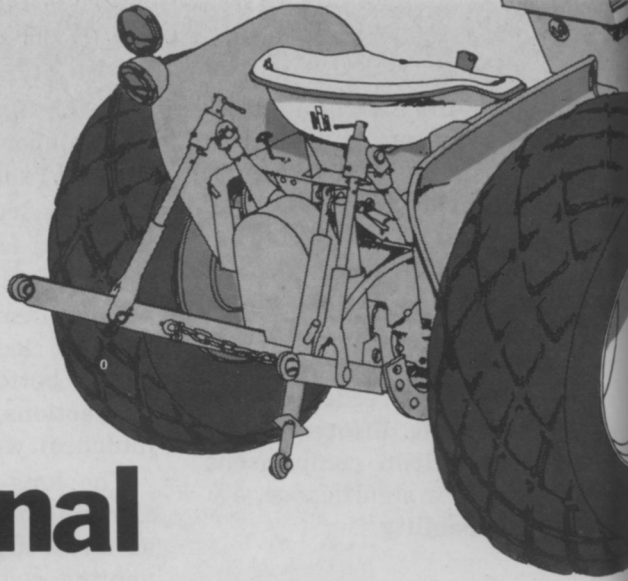


Wood pulp mulch was applied to this plot at the rate of 1200 lb./A. (Photo Three).



Pictured here is a plot mulched with green wood excelsior fiber at the rate of 2 tons/A. (Photo Four).

For More Details Circle (109) on Reply Card



New International Cub 154 Lo-Boy tractor



Worth more—
when you buy, use, trade

Under the sleek new look—a long-life engine and a 3-point hitch to quick-mount matched equipment . . .

Sure, it's smartly done—in appearance, in performance. Notice how much smoother the 15-hp water-cooled engine purrs along with its aluminum pistons and exhaust valve rotators. So quiet you can barely hear it idle.

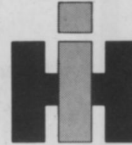
And at your fingertips, you'll find panel-clustered controls and levers. Puts you in instant command of mowers, blades, harrows, brooms. Any kind of matched equipment you'll want to use with the new independent power take-off or the optional new 3-point quick hitch.

Throttle-up to rated rpm. Shift into any gear. You cut up to 15 acres of grass a day with the hydraulic lift-controlled 60-inch

mower. Do it in more comfort in the padded, contour seat that adjusts fore and aft.

Want more? There's auto-type steering with tie-rods fully protected behind the oscillating I-beam front axle. Big diameter high-flotation rear tires (shown above). An 8-gallon fuel tank for a full day's work—and an efficient, self-cleaning, dry-type air cleaner.

See your International dealer. Test drive the most advanced all-purpose power package offered anywhere! His IHCC financing plans are scaled to fit almost any man's budget.



INDUSTRIAL EQUIPMENT

Wheel and crawler tractors • loaders • backhoes
dozers • forklifts • mowers • special duty tools

International, Cub and Lo-Boy are registered trademarks of International Harvester Company, Chicago 60611



KEEP AMERICA BEAUTIFUL



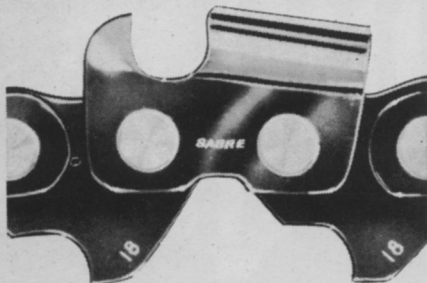
"The Pioneer in Foliar Feeding"

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

RAPID-GRO

For More Details Circle (112) on Reply Card

Try this for quality



(and price!)

it's the professional quality saw chain that saves you money...

SABRE

Because it costs less than other chains of comparable quality, it saves you money when you buy it. Because it is a tough, long-life chain it saves you money while you use it. Try it—you're covered by the Sabre no-time-limit guarantee.

SABRE the saw chain people



SABRE SAW CHAIN, INC.
840 SENECA ST.,
LEWISTON, N.Y. 14092

Write Dept. P for complete literature about Sabre Saw Chain and accessories for your saw.

For More Details Circle (104) on Reply Card

Table 3. Seedling counts and percentage contribution to plant stand as affected by mulch materials and erosion. See text for treatment materials.

Plant Types	Treatments				
	1	2	3	4	5
Grass					
Number Per Foot	10.3*	3.0	3.5	9.7*	6.7
% of Population	72 *	45	49	73 *	72
Clover					
Number Per Foot	.9*	.3	.5	.9*	.3
% of Population	5	5	7	7	3
Broadleaved Weeds					
Number Per Foot	1.6	1.8	1.8	.9	1.2
% of Population	11 *	27	25	7 *	13
Grassy Weeds					
Number Per Foot	.6	.9	.8	.8	.5
% of Population	4 *	13	11	6 *	5
Quackgrass					
Number Per Foot	1.0	.7	.5	1.0	.7
% of Population	7	10	8	8	7
Total Cover—					
Number of Plants Per Foot	14.4*	6.7	7.1	13.3*	9.4

* Mean of long-fibered mulches significantly different from mean of short-fibered mulches, 5% level of probability (read across).

desirable cover and weeds were present the second year but the differences were not statistically significant. Overall, on the basis of both 1965 and 1966 data, wood excelsior mulch appeared the best followed by straw-asphalt and Treatment 5. However, it should be pointed out that the lowest cover in 1966 was 82 percent and this is an acceptable amount.

The mulch function which was primarily evaluated in this study was erosion prevention. A secondary factor also evaluated was the effect of erosion on the plant stands and their composition. A second mulch function, that of moderating the environment around the seedling, was only evaluated by plant counts. These were probably more greatly influenced by the amount of erosion than by any moderating effect which the mulches might have had on the moisture and temperature regimes.

The long-fibered mulches gave good protection to the soil. The short-fibered mulches provided less adequate protection. The erosion on plots mulched by wood pulps not only removed a much greater amount of soil but

also greatly reduced the plant count of the seeded species. Apparently weed seeds were fairly evenly distributed in the upper few inches of soil and the resulting populations were not greatly reduced by erosion under the conditions of this study. However, due to the decrease in desirable plants on plots mulched with the wood pulps, weeds formed a greater percentage of the vegetative cover present on these plots. The vegetative cover on these plots was not only thinner but was composed of a higher percentage of undesirable plant types.

The wood pulps, however, do have a definite usefulness in highway erosion prevention work. The wood pulps can be readily used in spot and patch-up seeding operations. With the hydroseeder, the wood pulps can be easily placed on steep high slopes such as soil overburdens in rock cuts. Mulch blowing equipment for the long-fibered mulches cannot readily reach these areas. The wood pulp mulch acts as a "plaster" and helps hold seed and fertilizer in place until plant growth is started.

Bacterium Curbs Tree Defoliation



Pesticides containing *Bacillus thuringiensis* in sufficient amounts kills caterpillars in 24 to 72 hours.

MICROBIOLOGISTS at Wayne State University in Detroit, Mich. have discovered that *Bacillus thuringiensis*, a component of several commercial pesticides on the market today and effective against many insects of the Lepidoptera order (butterflies and moths), will eradicate the tussock moth caterpillar too.

Edward Hoffman, who worked with Professor Harold W. Rossmoore, of the W.S.U. Biology Dept., on the project, reports *Bacillus thuringiensis* has been proven not to harm anything except about 100 insects, almost exclusively the larvae of the moth-butterfly group. Hoffman

Tussock moth caterpillar, below, breeds in quantity.



states the organism has been safely fed in large test doses to beneficial insects such as bees and beetles plus birds and animals.

"The silkworm was one notable exception that has suffered fatally from eating it," he reveals.

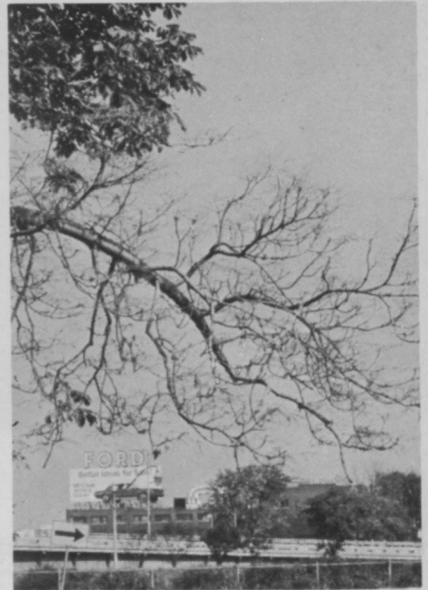
Bacillus thuringiensis, according to the *Pesticide Handbook*, 1968, published by Science Publishers (P.O. Box 798, State College, Pa.), can be found in the following products:

1. Stauffer Thuricide
2. N.P.I. (Nutrilite Products Inc.) Bio-Guard
3. E-Z Flo Tobacco Formula-B.T.B.

The bacterium is suspended in liquid. Landscape gardeners should follow a spray schedule identical to chemical insecticides.

The tussock moth caterpillar is a serious threat to ornamental trees. It can be found over a good portion of the United States, especially the eastern and central states.

Hoffman points out, "This insect is capable of defoliating entire trees in large enough quantities. Leaf damage around our university is evident where the tussock moth caterpillars literally number in the thousands.



Tussock moth caterpillars can quickly strip ornamental trees of their foliage.

"You can imagine how the population growth of the pest could reach disaster proportions when you consider an egg mass of the insect with about a 1/2-inch diameter could contain as many as 400 eggs.

"It's this availability that led to our findings concerning *Bacillus thuringiensis*. We needed an insect that was easy to raise in a laboratory so that we could study the effects of radiation on the susceptibility of insects to bacterial infection. It turned out we found this animal susceptible to this particular bacterium."

Bacillus thuringiensis is unusual, because it forms parasporal bodies popularly known as crystals. It is this crystalline material that causes the paralysis of the gut of the tussock moth caterpillar enabling the bacterium to grow inside the insect's intestine.

"It takes from 24 to 72 hours for the tussock moth caterpillar to die following ingestion of lethal amounts of the bacterium," Hoffman says.



Life-Saving Aerial Spray Missions In Vietnam

OPERATION RANCH HAND

THE Ranch Hands of the 12th Special Operations Squadron take to the sky as they wage their own war within a war in Vietnam. Their task: aerial defoliation at various strategic areas to help save the lives of their fighting compatriots. Their motto: "ONLY WE PREVENT FORESTS."

Officially known as Operation Ranch Hand, the "Ranch" has been killing undesirable Viet-

namese vegetation since January, 1962, although it was not designated a separate unit until last October.

Reportedly there are more than 1500 species of woody plants in Vietnam, varying in size from small shrubs to large trees, plus a wide variety of palms, woody vines and herbaceous plants.

Three basic types of herbicides are used: orange, white and blue. These colorful names are derived from the color-coded paint stripe that girdles each shipping drum.

Agent "orange" is a 50-50 mixture of butyl esters of 2,4-D and 2,4,5-T that is sprayed undiluted. Normally used for jungle defoliation, "orange" causes leaf fall in 3 to 6 weeks, with control persisting for 7 to 12 months.

"White" combines picloran

In Brief:

"Operation Ranch Hand" is the official designation of the Viet Nam aerial spraying program for purposes of defoliation. WTT presents this brief article on the program to illustrate the scope of spray operations. Certain herbicide shortages in this country are understandable in light of government expenditures for herbicides used to support our troops in Viet Nam.

with 2,4-D in a low volatility amine salt formulation to provide longer duration control of a wide spectrum of woody plants. This agent is similar to compositions used for aerial spraying of power line rights-of-way throughout the United States.

Desiccant agent "blue", cacodylic acid, is a contact herbicide used for rapid defoliation. It is an effective grass control agent, especially useful in keeping down heavy grassy vegetation along roadsides and around military encampments.

The basic spray plane is the twin-engine C-123 aircraft, equipped with a 1000-gallon chemical tank. Each plane is fitted with two wing booms, with 14 nozzles, and one tail boom, using 8 nozzles. Spray operations are controlled from a console located in the rear of the plane. If rains drench an area within two hours after spraying, the target must be re-sprayed. Generally, three to four hours are necessary for effective plant kill.

Normally the crew consists of pilot, co-pilot and a technical specialist who operates the spray console. The operator rides in an armored box; pilot and co-pilots don body armor and helmets for extra-added protection.

Spray equipment is calibrated to discharge the herbicide in five minutes; however, the 1000-gallon tank can be emptied in 30 seconds in case of emergency.

The spray run is made as close to the foliage as is practical, at a relatively slow speed. Viet-

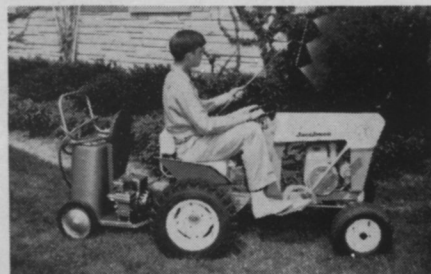
nam's forests have a canopy that can reach as high as 90 feet, with occasional trees towering to 125 feet. Generally the altitude for spray application is 150 feet. Pilots are always within range of small arms fire.

Flying their daily mission, the Ranch Hands — who call themselves "the most shot-at unit in Vietnam" — are favorite targets of the enemy. More than 3000

hits from ground fire have been taken by their planes, and that's only since they started counting, says Lt. Col. Arthur F. McConnell Jr., commander of the squadron.

"We had one UC-123 nicknamed Patches that took 546 hits from ground fire before she was sent back to the U.S. in June," McConnell added.

A Ranch mission is escorted by



We can help you on any spraying job

You get dependable performance on any spraying job—turf, ornamentals, trees—with Hudson power sprayers.

Big turf acreage? Consider our 150-gallon Peerless™. Can cover 10 acres an hour with 20-foot boom. More than enough pressure and output for other jobs—for reaching high into trees. More trouble-free service with features such as Ten-O-Matic® pump, stainless steel lined tank. Models on wheels or skids. Tank capacities to 300 gallons.

Smaller jobs? Pick a 12½-gallon Sub-

urban™ Trail-N-Spray™ or 50-gallon Peerless. Hitch to a compact tractor. Handle most any spray material to tackle most any spraying job.

Write us for full details on the complete line of Hudson power sprayers.

HUDSON®

POWER SPRAYERS



© 1969 H. D. Hudson Manufacturing Co.
589 E. Illinois St., Chicago, Ill. 60611

For More Details Circle (116) on Reply Card

Table 1. Herbicide expenditures in Viet Nam since 1966.

Fiscal Year	Expenditures Millions of Dollars
1966	12.5
1967	45.2
1968	43.2
1969	42.7*

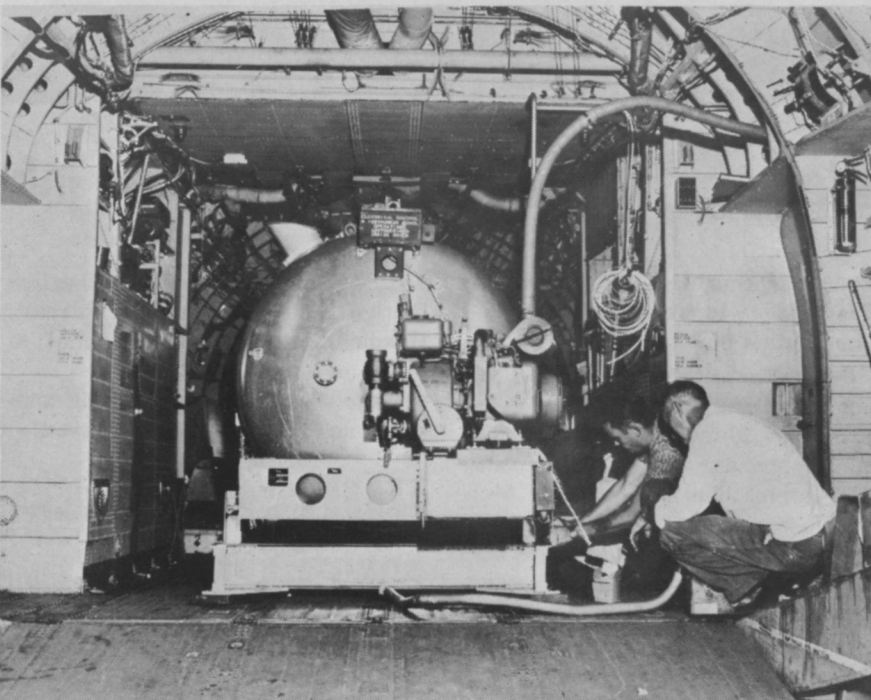
* Expected for delivery from U.S. manufacturers. Not necessarily a firm figure but the best estimate as of October 8, 1968.

Table 2. Scope of the Viet Nam defoliation program.

Year	Acres Sprayed		
	Defoliation	Viet Cong Crop Destruction	Total of Both
1962	17,119	717	17,836
1963	34,517	297	34,814
1964	53,873	10,136	64,009
1965	94,726	49,637	144,363
1966	775,894	112,678	888,572
1967	1,226,823	148,418	1,375,241



Spray boom is being installed on wing of twin-engine UC-123 used by the 'Ranch' for defoliation missions.



fighters who keep an eye out for trouble as spray runs are made. When a plane receives ground fire, the area is marked with purple smoke.

One plane, detailed to malaria control, makes spray runs over villages, bases and cities. Even these health-protecting missions — accompanied by loudspeakers designating them as peaceful runs — are fired on.

Wind, weather and thermal currents greatly influence the effectiveness of the spray applications. Best results are achieved in early morning—spraying must be finished no later than 11 a.m. — when the wind is calm.

Targets are selected via a complex chain of military decisions and political review. High officials—American and Vietnamese — must approve each site. Having cleared all desks, the request then goes to the U.S. Ambassador in Saigon. Occasionally, an especially ticklish request goes all the way to Washington.

Major targets include: Nipa palm and mangrove woodland in coastal areas and along traffic routes in rivers and canals in South Vietnam; moist evergreen or rainforests surrounding Viet Cong strongholds and supply dumps; dense shrubbery and second growth forests along highways, supply roads and railroads to reduce ambush threats; perimeters of villages and military bases; infiltration routes and supply trails in upland forests; and the Demilitarized Zone.

In spite of all precautions, occasional spray may drift and cause damage to rice crops or rubber trees (current price for a mature rubber tree is \$87). When claims are made, prompt action is taken to pay for damages.

Engineers and mechanics set up low-volume spray system positioned in rear of the plane. 1000-gallon tank can be emptied in 30 seconds if necessary.



John J. Spodnik, Pres.



Trade Show at the 40th International Turfgrass Conference and Show staged by the GCSAA was a major event. Practice putting at the IHC booth is Frank Thraillkill of Hercules, Inc., Montgomery, Ala. Looking on is Mrs. Jean Gass, Penn Turf Nurseries, Pittsburgh, Pa.

40th Meeting of Golf Course Superintendents

Leading Turfgrass Show At Miami Beach

A full course in turf culture is routine for golf course superintendents who attend their association annual meeting each year. The 40th International Turfgrass Conference and Show at Miami Beach Jan. 19-24 offered the most comprehensive information on turf research and current practices to be found.

This turf show featured leading turf researchers from universities and suppliers throughout the nation, as well as experienced superintendents from its own ranks. A major trade show with more than 300 exhibit spaces included practically every major manufacturer and supplier in the industry. The Golf Course Superintendents Association of America staged an annual event which to date has not been surpassed in the turf field in either educational program or trade show. Members attended in force. More than 2000 superintendents made the Florida trip this year. Their number was dou-

bled by wives, exhibitors, program participants, and guests. Attendance alone makes this a major show.

Topdressing Greens

Topdressing greens is often a controversial subject. All phases and methods of handling the practice were given special attention at this annual session. James Fulwider, course superintendent at Century Country Club, White Plains, N. Y., impressed the group with his philosophy. He said that the operator who carries out an extensive topdressing program must be a firm believer in the practice of topdressing. Fulwider indicated this has to be true for the superintendent to justify the extra cost of material, time and labor.

Fulwider himself is a firm believer in topdressing. He lists fewer thatch problems as one advantage of the practice. Providing other soil management prac-

actices are carried out, the presence of soil incorporated into thatch results, he said, in greater biological activity which is necessary for the decomposition of the undecayed material. Greens, he said, which have been topdressed regularly do not have a serious thatch problem.

Another plus for topdressing according to Fulwider is more resistance of greens to withstand winter injury. He pointed to metropolitan New York this past season where winter injury caused by extremely dry weather resulted in desiccation on many fairways, tees, and greens. He noted that greens which had a history of good topdressing programs came through in better shape.

Fulwider reported that as a regular practice, he topdresses greens every three or four weeks during the growing season. Soil is applied with a spreader and allowed to dry. It is then worked into the green with steel drag



ELANCO

Balar

granules

...available for professional veterinarians

Stop crabgrass with pre-emergence Balan. You can afford to pour it on.

It's easy on the budget and easy to apply. Balan makes big area coverage a breeze.

CRABGRASS KILLING POWER! Now you can stop crabgrass economically before it starts. Balan packs more crabgrass killing power in each pound of active ingredient, so it goes further at less cost.

Apply Balan early and you won't see unsightly crabgrass clumps or the dead brown areas they leave in the fall. Maintain a thick, green turf by keeping weed grasses from competing for moisture and nutrients. Get long lasting control of crabgrass, goosegrass, foxtails, and—all other annual weed grasses for \$15 to \$30 per acre. Balan is recommended by many golf course superintendents and industrial and institutional grounds superintendents across the country. Stop your crabgrass problem with Balan.

SO ECONOMICAL YOU CAN USE IT EVERYWHERE. Balan costs \$15 to \$30 an acre to prevent crabgrass. Southern warm season areas require the heavier application rate. Certain extreme warm season areas may require two applications of Balan to provide year-around control. Even so, Balan goes easy on

a modest grounds maintenance budget. And it gives you so much. You can count on dependable performance from Balan because it's waterproof, won't leach away under heavy rainfall or irrigation. Another consideration: Balan contains no poisonous arsenic, mercury or lead to create a hazard when used around public areas.

PLUS A CONVENIENT GRANULAR FORMULATION. You'll find Balan easy to handle, easy to apply with your present equipment.

Granules pour smoothly, won't clog. Isn't it time you took the completing step in your turf-care program? See your turf supply and equipment distributor.



(Balan™—benefin, Elanco)

One of Elanco's dependable weed-control crew.

Your first 100 square feet are on Elanco!



Free sample! A 4½ ounce shaker tube of Balan Granular. Enough to keep 100 square feet of turf clean of weed grasses for months.

Return the postage-paid card today. We'll send you full details on Balan, the name of your nearest distributor, and your free sample. Apply the sample evenly over an area approximately 10' x 10'. Do this shortly before crabgrass and other weed grasses germinate. See how your turf grows thicker, healthier without having to compete with weed grasses for sunlight, nutrients and moisture. Balan makes the difference.

OTHER MEMBERS OF ELANCO'S DEPENDABLE WEED CONTROL CREW:

TREFLAN®—dependable, long-lasting pre-emergence herbicide to control weeds and grasses in nursery stock or established ornamental shrubbery and flower beds.

DYMID®—versatile pre-emergence herbicide to control weeds and grasses in ornamentals, dichondra or ice plant ground covers. Particularly effective against certain winter germinating weeds.

ELANCO PRODUCTS COMPANY
A division of Eli Lilly and Company
Indianapolis, Ind. 46206, U.S.A.



mats and wooden rakes. This practice, he said, levels the surface, cleans the green, and removes pebbles and rocks which can damage a mower. Greens are then thoroughly watered by hand so that the new soil reaches the old soil. In summary, Fulwider said that he regarded the practice of top dressing as a good, sound, preventative measure in golf course maintenance, rather than as a special effort to correct a bad situation.

Southern Turf

The preferred types and varieties of turf for use in the South were reviewed by Dr. Glenn W. Burton, USDA research geneticist at the University of Georgia, Tifton, Ga. In the case of top-quality greens, a grass must be able to withstand daily defoliation at a 3/16-inch height and still maintain a smooth, uniform surface. Leaves of the grass must be fine, soft and closely spaced. To meet these rigid needs, Burton listed only two species. He named bentgrass and bermudagrass, but added that bentgrass is not dependable in most of the South.

For tees, Burton pointed out, a variety must be tough to withstand the normal punishment. It needs dense, stiff leaves and must be able to heal rapidly. Bermudagrass, he said, with its dense, rhizomatous habit has proved to be the South's best species.

Fairways, besides being an attractive, uniform carpet with density enough to give a good lie to the ball, must be able to heal divots rapidly and tolerate heavy traffic. Further, a fairway grass must be capable of filling these needs with less water and care than normal for greens and tees. Burton listed bermudagrass above all species for fairway use in this area.

Lawn areas need to be attractive, green, and weed-free. Many lawn areas are shaded or other-

♦ For More Details Circle (121) on Reply Card

James W. Brandt, outgoing president of the GCSAA and superintendent of the Danville, Ill., Country Club, formally opened the 40th Show of the group.



wise unfavorable for grass growth. A number of species can be used. Burton listed bermudagrass, centipedegrass, St. Augustinegrass, carpetgrass, and zoysia.

Roughs, he stated, should not be a source of weed seeds to contaminate the remainder of the course. Grass in this area should be green, reasonably weed-free and of acceptable height. Usually the fairway grasses, cut higher, will serve.

Golf Courses Expensive

Costs to build a regulation length golf course today varies from \$200,000 to \$2 million according to Colonel Harry C. Eckhoff, eastern director of the National Golf Foundation. Even though courses can be readied for play at the lower figure, Eckhoff stated that this is seldom accomplished today for less than one-half million dollars.

He pointed out that more and more people are playing golf.

Course superintendents, he said, must now grow and maintain 56 percent more and finer turf to handle a 123 percent increase in traffic. This problem of more than doubled traffic during the past 10 years has created more compaction and disease problems in turf management. Added to turf care problems, Eckhoff said, is the problem of finding and keeping labor.

He also pointed to the need for more public links to accommodate what has become America's fastest growing outdoor participant sport — golf — despite a rapid increase in the development of public facilities over the past decade.

"Only 53 percent of the nation's courses are public and 84 percent of the golfers allegedly play these courses," Eckhoff said.

He pointed out a recent NGF study.

"It showed," he said, "that 45 percent of America's 11,000,000

golfers use municipal courses; 39 percent semi-private and 16 percent private." Public courses are semi-private — privately owned but open to the public on a daily fee basis—and municipal courses which are open to anyone.

In heavily populated areas, playing conditions have become so extreme on weekends that local radio stations broadcast the waiting times for tee off as a public service, Eckhoff stated.

He said public courses, however, are increasing, indicated by the following growth factors:

—In 1968, public operations were up 11 percent over 1958: 65 percent of all new golf courses open for play were public, a gain of 4 percent over 1967.

—In the ten-year period ended December 31, 1968, semi-private courses increased 115 percent; municipal courses, 45 percent; and private clubs, 42 percent.

Houston has been selected as the site for the organization's 41st International Turfgrass Conference & Show, which will be held February 8-13, 1970, at the Albert Thomas Convention & Exhibit Center. GCSAA's last appearance in Houston was in 1960.

GCSAA president James W. Brandt, Danville (Illinois) Country Club, said the Rice Hotel will serve as Conference headquarters.

John Spodnik, golf course superintendent, Westfield Country Club, LeRoy, Ohio, was elected new president. Elected vice president was Norman W. Kramer, Point O'Woods Country Club, Benton Harbor, Michigan. Re-elected as a director was Robert V. Mitchell, Sunset Country Club, St. Louis, Missouri. New directors include Warren A. Bidwell, Philadelphia Country Club, Gladwyne, Pennsylvania and Keith Nisbet, Westview Golf Club, Aurora, Ontario, Canada. Reappointed to the board for a one-year term was Clifford A. Wagoner, Del Rio Country Club, Modesto, California.



New officers elected at the January session of the Virginia Turfgrass Council, left to right: Sheldon Betterly, president; Charles K. Curry, first vice-president; Lee C. Dieter, 2nd vice-president; R. D. Cake, secretary-treasurer; William P. Mooney, newly elected director; and Darryl McCabe, director elected last year.

Ninth Conference Staged By Virginia Turf Council

Turf management, both the techniques of managing grass and the economic aspects of a well coordinated program, was stressed at the ninth Virginia Turfgrass Conference held recently at Richmond, Va.

More than 200 members and guests of the Virginia Turfgrass Council attended a 2-day session. Sponsors along with the Council was the Cooperative Extension Service of Virginia.

Officers elected for the new year are: Sheldon Betterly, president, sod grower at Nokesville;

Charles K. Curry, Eastern sales representative for Ryan Equipment Company at Manassas, 1st vice-president; Lee C. Dieter, superintendent at Washington Golf and Country Club, Arlington, 2nd vice-president; R. D. Cake, George Tait and Sons Seed, Norfolk, secretary-treasurer; B. K. Powers, Weblite Corporation, Roanoke, director; and William P. Mooney, superintendent at Langley Air Base, director.

J. F. Shoulders, Extension Turf Specialist, served as program chairman and Roy Watson superintendent at Richmond Country Club and past president of the Council, handled local arrangements.



John Shoulders, left, program chairman, and Roy Watson, a past president, and in charge of arrangements visit during conference.

The Glory of the Tree

by Dr. B. K. Boom and H. Kleijn. First published in Great Britain, 1966, by George G. Harrap & Co. Ltd.; and by H. J. W. Becht's Uitgeverijmaatschappij N.V., Amsterdam 1966; distributed in United States by Pat Ryan, Portland, Ore. 128 pp. \$12.50.

The Glory of the Tree is a magnificently illustrated volume which contains almost 200 color photographs and many line drawings. Now being printed in the Netherlands, it has been translated and is available for arborists and others interested in trees in the United States. Aid-ing in the translation for use here was Dr. Edgar T. Wherry, professor of Botany, Emeritus, University of Pennsylvania.

The authors describe and illustrate the beauty of individual trees in spring foliage, summer splendor, and wintertime power. Photos show each tree in its natural surroundings, whether in the forest, along highways, on plains, mountains, or wherever.

Illustrations in color are among the finest to be found on the subject.

In each instance, the authors present the structure, nomenclature, history and practical use of the specific species. The narrative includes many legends and much history about the origin and cultural importance of each.

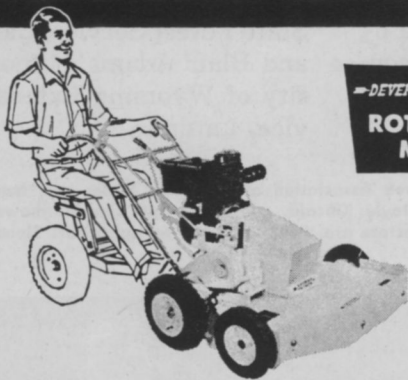
The Rowan tree, as one example, is one of the Holy Trees of the old Celtic and Germanic worlds. It was thought to be of great spiritual power. The Ginkgo tree is believed by some Chinese and Japanese to have the power to turn away fire. The Cypress is an ancient tree which the Greeks considered a symbol of feminine beauty and also of death.

The authors also discuss the Laurel, Cherry, Medlar, Pine, Plane, Cedar, and many other trees from both the Old World and the New, as well as from Asia and the Middle East.

The Glory of the Tree is an important work for both professional and layman who find themselves interested in more than a surface knowledge of the tree. Special features include a list of botanical gardens and arboreta, a list of trees shown on postage stamps, an explanation of the Latin species names, and a selected list of books on trees.

Regarding the authors, H. Kleijn is one of the famous Dutch experts in the field of natural history and an author of many published works in the field. Dr. B. K. Boom is a horticultural taxonomist at the Institute of Horticultural Plant-breeding, Wageningen, Holland. G. D. Swanenburg de Veye, who made the photographs is a doctor of medicine, a member of the Royal Dutch Society for Natural History, and a writer on mycol-ogy.

For information, circle (703) on the reader service card in the front of this issue.



—DEVERE—Locke
**ROTARY
MOWERS**

DEVERE-Locke Rotaries
'Cost LESS per Mowing'
... Easier on operators too!

Ruggedly constructed with plenty of power for quality cuts on any terrain. Years of maintenance-free service. 18" to 60" • 3 to 12½-hp • Riders • Constant cutter speed

Manufacturers of famous **Locke** reel mowers

25" and 30" Single Units • 70" and 75" Triplexes • Electric Starter

Locke

WRITE FOR FREE BOOKLET
Manufacturing Companies, Inc.
5637-Y MacCorkle Ave., S.W., S. Charleston, W. Va.

For More Details Circle (111) on Reply Card

GOOD LABOR HARD TO FIND?
Howard POWER-ARM Backhoe
does many jobs—faster and at lower cost



Here's fast, dependable, low-cost labor for jobs such as digging new ditches or cleaning out old ones, trenching for tile and utility lines, irrigating, moving dirt and other bulk materials, loading, etc. Get the full story on the Howard POWER-ARM Backhoe and Loader. It does the work of several men!

**HOWARD
POWER-ARM**

Howard Rotavator Co., Inc.
Dept. 209
Harvard, Ill. 60033

BACKHOE AND LOADER

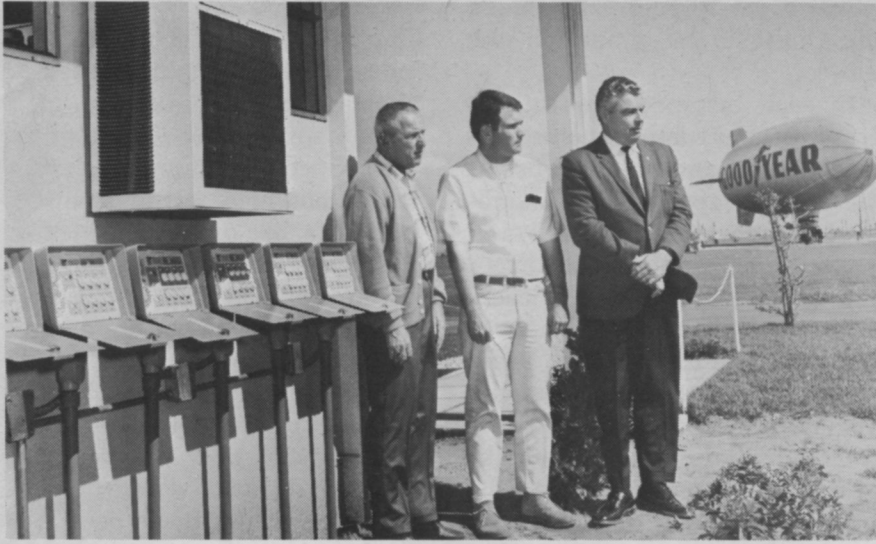
Please send information on the new Howard Power-Arm

Name _____

Address _____

City _____ State _____ Zip _____

For More Details Circle (105) on Reply Card



Six Rain Clox-8 electronic controllers work 'round the clock at Los Angeles home port of the "Columbia." Their job: to keep the 30-acre landing pad irrigated without interrupting her flight schedule (14 voyages daily), or showering her passengers. Team responsible, left to right, for the complex automatic sprinkler system installation: John Motshagen, sprinkler contractor; Carl D. Johnson, landscape architect, Westcoast Landscape Construction; and Jack Gray, irrigation specialist, Oranco Supply Co.

Automatic Irrigation For Goodyear Blimp Pad

Irrigating a landing pad for a blimp without dousing blimp or passengers was solved with six electronic controllers and a flock of impact sprinklers programmed to operate on a "flight schedule."

Goodyear Tire and Rubber Company wanted their new multi-million dollar Los Angeles home port for the "Columbia" (one of the company's two blimps which operate year-round) to have an all-turf 30-acre landing pad, landscaped "in harmony with a neighboring golf course."

The problem of irrigating the turf arose because of the blimp's busy flight schedule: sprinkler spray could interfere with take-offs and landings and might shower passengers and sight-seers on the pad. (The "Columbia" makes as many as 14 voyages a day and sometimes flies at night.)

By programming the controllers to operate the 25,000 feet of sprinkler line only when the Columbia is in flight or safely docked for the night, proper irrigation is accomplished without conflicts.

With the completely automatic

Rain Bird system, and with the controllers located at the blimp administration building, one man can supervise irrigation of the entire 30 acres.

Landscape architect for the project was Carl D. Johnson, Westcoast Landscape Construction. The system was installed by John Motshagen, sprinkler contractor. All Rain Bird equipment was from Oranco Supply Co.

Colorado's Kincaid Heads New Shade Tree Group

Doyle Kincaid of Kincaid Tree Surgery, Fort Collins, Colo., was recently elected president of the newly organized Shade Tree Association of Mountain States.

Also elected to office were: Vice Pres.—Bill Schacht, city forester of Colorado Springs; and Sec.-Treas. — Jim Matthews of John Bean division, Ford Motor Co., Boulder.

Specific objective of the association, according to Kincaid, is to promote planting and proper care of adapted shade tree varieties in Colorado and surrounding states.

Directors for the association are: C. G. Wilhelm of Wilhelm Tree Surgery in Denver; Earl Sinnamon of Swingle Tree Surgery, Denver; Jerry Morris of Rocky Mountain Tree Experts, Wheat Ridge; Bob Kirby of Kirby Tree Service in Colorado Springs; Don Young of Colorado State Forest Service, Canon City and Blair Adams of the University of Wyoming Extension Service, Laramie.

Newly elected officers of the Shade Tree Association of Mountain States are, front row, left to right: Bill Schacht, vice president; Doyle Kincaid, president; and Jim Matthews, secretary-treasurer. Three of the association's directors are, back row, left to right: Earl Sinnamon; C. G. Wilhelm; and Jerry Morris.



STIHL 041 AV *electronic*

In keeping with our policy of offering the most advanced and most dependable in chain saws — we have incorporated solid state ignition into the STIHL 041 AV Electronic Saw. Other than eliminating the need for points and providing a molded circuit that is impervious to moisture, dirt, and temperature extremes — this model offers big horsepower performance coupled with a light 12 pound* weight and the fabulous new vibration absorbing AV handle.

STIHL American, Inc.

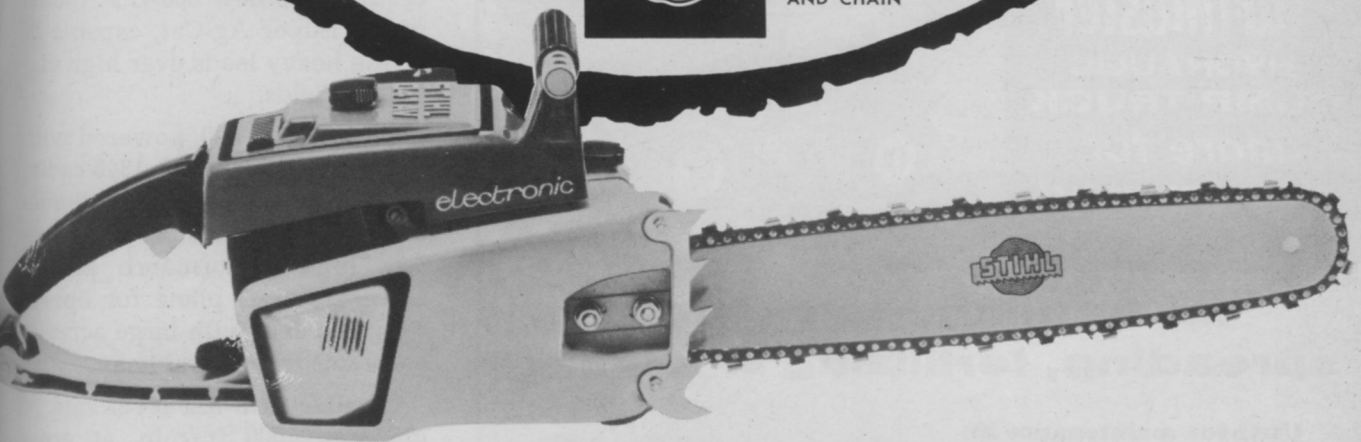
194 Greenwood Ave.,
Midland Park, N.J.
Phone 201-445-0890

7364 Lee Industrial Blvd.,
Mableton (Atlanta)
Georgia

2468 Teagarden Street,
San Leandro
California



* LESS BAR
AND CHAIN



new

For More Details Circle (122) on Reply Card



Southern Weed Science Society elected new officers during its 1969 session, January 21-23 at Dallas. From left, seated: Leonard Lett of Colloidal Products Corp., Memphis, immediate past president; Dr. John B. Baker, Department of Botany and Plant Pathology at Louisiana State University, the new president; and Dr. Paul W. Santelmann, Department of Agronomy at Oklahoma State University, new secretary and treasurer. From left, standing: Douglas Boatright of Horne-Boatright Chemical Company at Birmingham, the new president-elect; Gill K. Brown of Georgia Power Company at Atlanta, executive board member; Frank B. McGowan of The Dow Chemical Company at Atlanta, executive board member, and Dr. A. Doug Worsham of the Crop Science Department, North Carolina State University, publications editor. The society scheduled its 1970 conference in Atlanta. Not shown here is the final member of the executive board, Dr. W. E. Chappel of Virginia Polytechnic Institute.

Buckner Catalog Describes New Long-Range Sprinklers

New from Fresno's Buckner Sprinkler Company is its 1969 Turf Sprinklers catalog describing the company's complete line of industrial sprinklers and irrigation accessories.

The 44-page booklet includes specifications, performance tables and prices for underground sprinklers and accessories, portable sprinkler units, heavy industrial turf products and automatic controllers and valves.

It also introduces a new, long-range portable sprinkler with full- or part-circle coverage and describes a new series of impact rotary pop-up sprinklers for long-range use.

For a free copy, circle (701) on the reader service card in this issue.

Grumman Develops Ag-Cat For High 'N' Heavy Flying

Grumman Aircraft Engineering Corporation, Bethpage, N. Y., recently announced that the Federal Aviation Administration has certified its new 600-H.P. model of the Super Ag-Cat, capable of flying heavy loads over high elevation fields.

The Ag-Cat 600, powered with a Pratt & Whitney R-1340 radial engine and using a 9-foot-diameter constant-speed propeller, offers high performance plus a more practical plane for operators who deal with large acreage contracts, says Grumman.

Capable of a sea level rate of climb of 1600 ft./min. at gross weight, it will still maintain a rate of over 700 ft./min at an altitude of 11,000 feet, Grumman says. General flight characteristics of the Ag-Cat 600 remain unchanged from their super-safe, lower-powered models, the company assures.

For more information, circle (702) on the reader service card in the front of this issue.

THE ALL PURPOSE

Turfmaster

HYDRAULIC
DUMP TRUCK

more for
your money!

for hauling, dumping,
spreading, fertilizing & towing

Used for maintenance in:

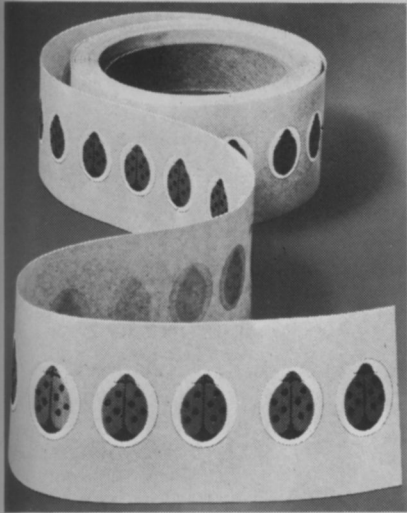
Cemeteries · institutions · hospitals · schools · shopping centers · public buildings · institutions · highways · expressways · industrial plants · golf courses · recreation areas · airports · landscape contractors/specialists · and many other uses.

Complete specs and details available

W. J. HEINRICHS

21013 E. Dinuba, Reedley, Calif. 93654 A/C 209 638-3627

For More Details Circle (106) on Reply Card



Hudson Manufacturing's "good-guy ladybugs" are decorative paste-ons, 3/4" in diameter and printed on durable fabric.

Hudson Offers Yardful Of 'Good Guy Ladybugs'

The H. D. Hudson Manufacturing Company, makers of Hudson sprayers and dusters and an archenemy of insect pests, reports that "all bugs aren't bad."

Accordingly, the company is offering a "yardfull of good-guy ladybugs"—a 3-foot strip of full-color ladybugs—free for the asking as part of its ladybug jewelry promotion. The perky paste-ons can be used to decorate almost anything (equipment, in-store displays, stationery, clothing anywhere (in the office or at home), says Hudson.

For your free "yardfull" write on your business letterhead to the company's Advertising Department, 589 East Illinois St., Chicago 60611.

Stauffer Chemical Chooses Distributor for Vaporooter™

Stauffer Chemical Company, New York, N. Y., recently licensed Airrigation Engineering Company, Inc. of Los Gatos, Calif., to market its new foam fumigant — Vaporooter™ — for sewer root control.

The new fumigant, a water-soluble, surface-active formulation of Stauffer Chemical's VAPAM^R, controls growth of plant roots in sewer main inte-

riors, according to the company. It also helps control fungi and bacteria that produce slime and fatty acids which generate hydrogen sulfite — the primary cause of unpleasant sewer odor.

Davey Tree Firms Join Forces, Expands Operations

The Davey Tree Expert Company with headquarters at Kent, Ohio has announced the recent

acquisition of the San Francisco-based Davey Tree Surgery Company, Ltd.

Davey's new subsidiary, with branches in Arizona, California, Nevada, Oregon and Washington, now provides the company with a coast-to-coast operation.

Keith L. Davey, currently the 1969 president of the International Shade Tree Conference, will continue as president of Davey Tree Surgery.



The SLOPE-RUNNER

Operates Safely in Areas Where Others Fear to Tread

This new industrial tractor is as rugged and as powerful as most conventional tractors but with a big difference... its hydraulic sloping controls allows it to easily perform jobs far beyond the safety limits of other tractors. By simply adjusting a hydraulic lever mounted on the tractor's control panel, the operator can adjust the wheels to side slopes up to 30 degrees. As the unit "leans" into an incline, the weight shifts to the wheels on the uphill grade providing a valuable stabilizing feature.

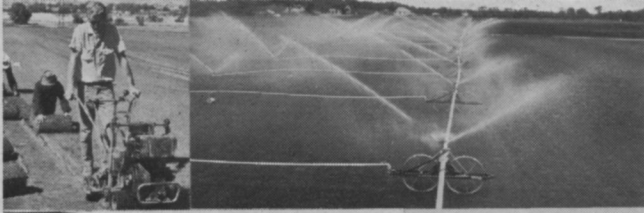
The Slope Tractor will mow steep roadsides and highway embankments yet the driver is safe and level. It automatically follows the inclination of the rear axle, assuring the operator that the mower blade is always parallel to the surface being mowed. Other attachments include a side mounted auger-type posthole digger and a sickle-type mower. Soon to be available are the following additional attachments: A rear trencher, a center mounted grader blade, a grass seeder, sprayer, front-mounted broom, and flail-type mower.

"WE COPE WITH THE SLOPE"

For additional information, write: SLOPE TRACTOR, INC., Harper, Kansas 67058



For More Details Circle (113) on Reply Card



SOD INDUSTRY SURVEY

a comprehensive study of
U.S. sod production and
marketing practices

Cultivated sod is now a \$100 million crop in the United States. That's the wholesale price at the field. Not only are growers producing and selling more sod than previously thought, they've had more years in business than most in the industry would have guessed.

These and other new facts about sod came to light in a comprehensive study of the industry by WEEDS TREES AND TURF magazine staff members. This magazine study with the help of officials of the American Sod Producers Association has been able to pinpoint the current number of growers in the U.S. at about 900.

WTT's circulation lists include almost 1200 readers who categorize themselves as sod growers. These include, however, a number of larger farms where foremen and partners also receive the magazine. This list further includes about 40 who are primarily large grass seed producers. The WTT survey was sent to 1196 (see Table 1) growers. It

Table 1. Results of survey among all sod producers on WEEDS TREES AND TURF circulation lists.

Survey Questionnaires Mailed*	1196
Questionnaires Returned	256
Returns	21.4%

*Only Owner-Operators Asked To Complete Survey Questions

asked them to not return the questionnaire unless they were an owner-operator. The idea was to eliminate all duplications.

A total of 256 surveys were returned. This amounts to almost 30 percent of the estimated 900 growers in the nation. Thus the results proved to be excellent and the data are highly reliable.

New Market Facts

The 256 growers who reported their cultivated sod acreage said they were growing 45,967 acres. (see Table 2). Projected (3½ times 256 equals the approximate 896 growers in the nation and the same formula can be applied to their acreage), this

Table 2. Report of growers on the number of acres of cultivated sod produced yearly in the United States.

Question: How many acres of sod do you have under cultivation?

Answers: 256

Total Acreage: 45,967

Average Acreage Per Farm: 179.5 acres

Projected (896 growers): 160,884 acres

Table 3. Report of growers on the number of acres of sod marketed yearly in the United States.

Question: How many acres of sod do you market each year?

Answers: 251

Total Acres Marketed: 20,990

Average Acreage Per Farm: 83.6 acres

Projected (896 growers): 74,905 acres

Table 4. Average number of years experience in growing sod among U.S. growers.

Question: How many years have you been growing sod?

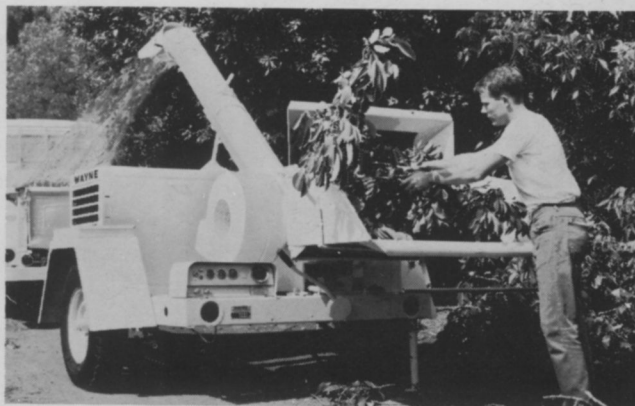
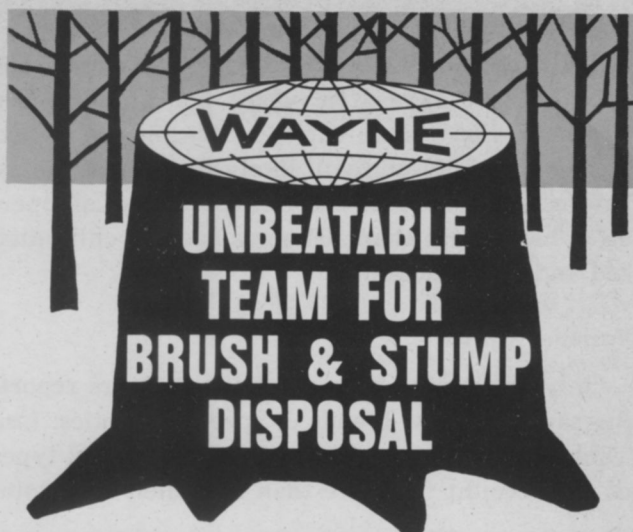
Answers: 251

Average: 9.6 years per grower

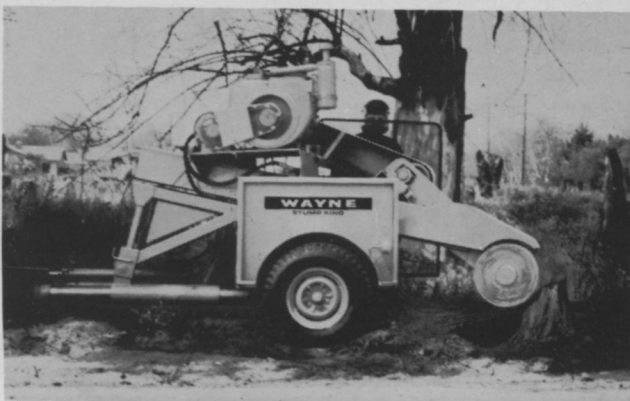
indicates a total sod acreage in the country of 160,884. This amounts to 179.5 acres per farm, again on the basis of almost 900 growers.

On the market side, growers report they are selling 83.6 acres of mature sod each year on a per farm basis. The 256 actually reported selling almost 21,000 acres in 1968. (see Table 3). When projected the actual figure is 74,905 acres marketed yearly. Selling prices of sod at the field vary from area to area, and there is even greater variation in field prices of speciality varieties. Even so, when the going field prices of sod are applied to the almost 75,000 acres being sold each year, the \$100 million estimated for the total crop becomes a reliable barometer of growth in this phase of the industry.

Growers have been in the business longer than
WEEDS TREES AND TURF, March, 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 (102) on Reply Card

anticipated. The 251 reporting their experience show an average of 9.6 years per grower. (see Table 4). Sod farms vary greatly in size as expected (Table 5) and will likely continue to do so. Interesting is the fact that nine percent of all operators have more than 500 acres each of cultivated sod under production.

Varieties Grown

Only about nine percent of the growers reporting say they grow blends or special varieties. (see Table 6). But for those who do, these special types of sod account for more than half their own total

Table 5. Size of sod farms as reported by U.S. growers.

Size of Operation	Number Reporting	Projected*	Percent
500 or more	23	81	9.0
300-499	22	77	8.6
100-299	74	259	28.9
50-99	58	202	22.7
25-49	29	102	11.3
Less than 25	50	175	19.5
Totals	256	896	100.0%

*Based on 896 growers (No. reporting x 3½)

Table 6. Growers report on the number who grow blends or special varieties of sod.

Question: Do you grow blends or special varieties?

Answers: 23 yes

Percent of Total Acreage Grown	54.7% (blends)
Total Acreage Reported	1260 acres
Projected (80 growers)	4410 acres
Total Growing Blends (896 growers)	Approximately 9.0%

Table 7. Varieties of cultivated sod now being grown in the U.S.

Question: What varieties of sod do you produce?

Variety	Answers	Acreage	% of Crop
Merion	144	17,455	38.0
Fylking	41	415	0.9
Windsor	28	825	1.8
Park	32	1,580	3.4
Newport	19	782	1.7
*Other	161	16,154	35.1
Unreported	—	8,757	19.1
	425	45,967	100.0%

*Pennlawn, Bahia, Centipede, St. Augustine, Bitter Blue, Zoysia, Tifgreen, Bermuda, Prato, Northrup-King, Penn-cross, Kentucky Blue, Delta, Buffalo, Tifdwarf, Tifton, Emerald, Warrens, Seaside, Gulf Brand, Miscellaneous Blends

Table 8. Methods of handling sod as reported by growers.

Question: How do you handle sod?

	Number Reporting	Percent
Rolled and loaded by hand	114	37.6
Folded on pallets	48	15.9
Rolls on pallets	47	15.5
Rolled and loaded by elevator	37	12.2
*Other	57	18.8
Totals	303	100.0%

*steel pallets; slabbed on pallets; harvester; rolled by machine and loaded by customers; hand shovel and hand load; sod pluggers and verticut; uncut and contracted

Table 9. Grower response as to where sod is delivered.

Question: Do you deliver to point of sale?

199 yes—77.7% of growers

Do you sell for pick-up at field?

192 yes—75.0% of growers

Both Practices—135 yes—52.7% of growers

production. Merion remains by far the dominant variety of cultivated sod (Table 7) though new varieties are making inroads in the market.

Despite the growth of cultivated sod, new methods of handling are lagging. More than one grower in three (some reported more than 1 method of handling) indicate they are still rolling and loading sod by hand. A number roll by machine and leave loading to customers. Still others sell their crop uncut and on a contract basis. Added up, the study indicates that more than half (see Table 8) of all growers are still doing much of the heavy labor required in sod production by hand.

More than half of all growers sell both at the field and also deliver sod. A total of 52.7 percent

said they used both methods (Table 9) in moving their crop. As to who buys the crop, the survey proved very revealing (see Table 10). More than 40 percent goes to landscapers. But one of every four acres sold goes direct to homeowners.

Selling Helps

More and more salesmen are being employed by growers to move their crop on a regular basis. A total of 39 growers of the 256 returning questionnaires said they employed one or more salesmen. (see Table 11). This on a projected basis would indicate that almost 300 are now employed in moving sod.

In the field of advertising, the WTT study indicates that many growers are hesitant to use many of the advertising opportunities open to them. For example, less than half, only 47.4 percent, use telephone book yellow pages. (see Table 12). Fewer

Table 10. Report of growers on purchasers of cultivated sod in the U.S.

Question: Where do you market sod?

Answers: 247

	Percent of Crop Sold
Landscapers	40.7
Direct to Homeowners	25.6
Industry	7.4
Garden Centers	6.9
Golf Courses	3.9
Other Sod Growers For Resale	3.5
*Other	12.0
	<hr/> 100.0%

*state and city governments; retail sod haulers and truckers; general contractors, builders and developers; cemeteries; schools; parks; utilities

Table 11. Number of salesmen employed by sod producers in marketing their cultivated sod.

Question: Do you employ salesmen?

Answers: 39 yes 217 no

Percent using salesmen: 15.2%

Total Salesmen employed: 82

Projected (total salesmen, 896 growers): 287

Table 12. Types of advertising used by growers in developing a market for cultivated sod.

Question: Do you do any advertising besides personal contact?

Answers: 171 yes 82 no

Types of advertising	No. answers	Percent
Yellow Pages	120	47.4
Newspapers	112	44.0
Direct Mail	51	20.0
Radio	23	9.0
Magazines	20	7.9
Television	2	.7
*Other	18	7.0
Totals	<hr/> 346	<hr/> 139.0%

use local newspaper ads and even fewer use any form of direct mail.

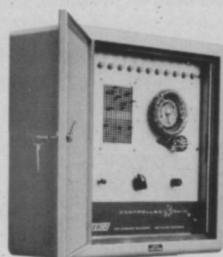
By contrast, growers have made significant strides in improving efficiency. A big 68 percent

WEEDS TREES AND TURF, March, 1969

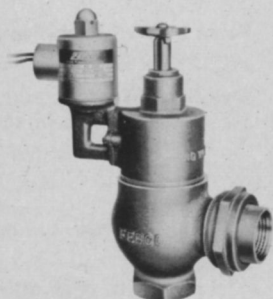
ALL YOU ADD IS WATER

THE COMPLETE LINE

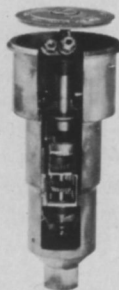
QUALITY IRRIGATION EQUIPMENT



17 Controllers, 1-24 Stations



54 Valves, 3/4" - 6"



96 Sprinklers, 1/2" - 1-1/2"



79 Vacuum Breakers, 1/4" - 8"

FROM PLANS TO PERFORMANCE

When you plan a sprinkler system, check with Febco, the complete line quality irrigation equipment company. Sprinkler system design service and irrigation equipment — at Febco, one call does it all — and at competitive prices.

Febco's engineering service is available to landscape architects, engineers and park directors for custom designing sprinkler systems and supervising installation of systems. It's Febco all the way. Write for free catalog.

NOW IN OUR FIFTH DECADE

FEBCO Incorporated

P. O. Box 368
9121 Glenoaks Blvd.
Sun Valley, California 91352

For More Details Circle (101) on Reply Card

Table 13. Methods employed by growers to improve efficiency in handling and marketing sod.

Question: What steps have you taken to improve efficiency?

	Number Reporting	Percent
New Equipment	162	68.0
Changed Varieties	38	16.0
Advertised	18	7.6
Irrigated	14	5.9
*Other	6	2.5
Totals	238	100.0%

*Changed personnel; invented equipment; fertilized more; changed handling and marketing methods; better seed

Table 14. Major problems of sod growers in producing and marketing cultivated sod.

Question: What do you consider the major obstacles for growers in sod production and marketing?

	Number Reporting	Percent
Labor (cost, shortage, turnover)	89	54.5
Price (low, high, pricecutting, greediness, control)	39	23.9
Consumer Education	17	11.0
Collecting	12	7.4
Over production	10	6.1
*Others	6	3.7
Totals	163	100.0%

*bad seed; diseases; competition; lack of product promotion; rising costs; fly-by-night installers

Table 15. Report of growers on the 1968 sod production business.

Question: How was your business in 1968?

	Number Reporting	Percent
Increased	133	53.9
Stayed about the same	94	38.0
Decreased	20	8.1
Totals	247	100.0%

Table 16. Business outlook of growers for 1969.

Question: What do you expect businesswise for 1969?

	Number Reporting	Percent
Better year	147	61.0
About the same	90	37.3
Worse than '68	4	1.7
Totals	241	100.0%

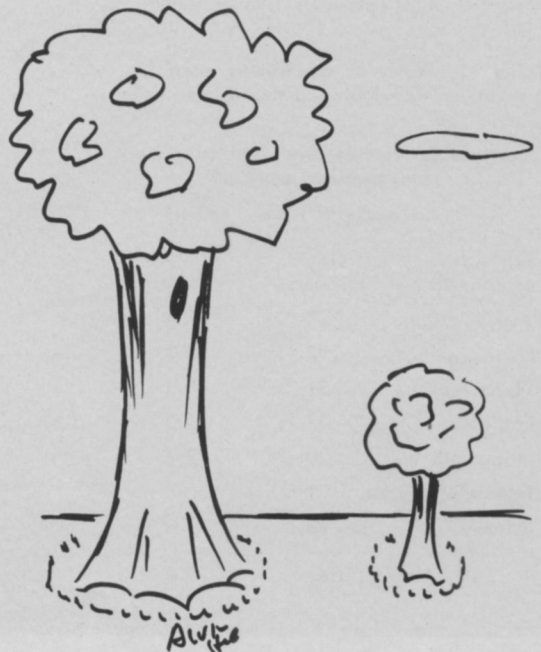
report they have added new equipment during the last few years to improve management. (see Table 13). More than one in seven have changed varieties in an effort to improve their operations.

Major problems in growing and selling the crop would appear to be labor and pricing. More than half the growers said costs, shortages, and turnover of labor constituted their major problem. (see Table 14). Almost one of every four reporting listed pricing of the crop as the key problem area. Still others feel that consumers (homeowners and users generally) need to be made aware of the value of sod. Collecting, as expected, continues to be a problem in marketing.

Business Outlook Optimistic

Growers generally enjoyed a good year in 1968. More than 90 percent said business was as good or better than the previous season. (see Table 15). Significant is that more than half — 53.9% — said business increased.

For 1969, growers are especially optimistic. (see Table 16). More than six of 10, (or 61 percent) expect a better year than 1968 which was in itself a year of increasing business. Some 37.3 percent expect a year of about the same. Less than 2 percent — 1.7% — believe business will be down. These growers expectations — based on the experience of many veteran growers would indicate that an extremely strong market for sod will be the norm for 1969.



"JUST THINK — ONE OF THESE DAYS THIS WILL BE YOURS — IF SOME WOMAN DRIVER DOESN'T KNOCK YOU DOWN FIRST."



Drs. G. C. Horn, left, turf technologist, and Eliot Roberts, chairman, Department of Ornamental Horticulture, University of Florida, Gainesville, were featured speakers on ASPA program.



Growers Tour Florida Sod Farms During 2nd ASPA Annual Meeting

A different group of sod producers attended the American Sod Producers Association's 2nd annual meeting at Miami Beach January 22 than the initial session at San Francisco last year. This indicates a healthy interest by growers in many sections of the country. Naturally, the 100 or more at the 2nd annual event this year included many regulars who have been instrumental in building the new association of growers.

Big news this year was appointment of Henry W. Indyk, turf specialist at Rutgers University, New Brunswick, N.J. as executive-secretary of the ASPA. Indyk succeeds George B. Hammond, Paint Valley Bluegrass Farm, Columbus, Ohio. Hammond has worked diligently in helping organize and build the association, but felt he could not allot the necessary time in the future which ASPA business will require. Indyk has been active in the sod industry and has done much to promote the industry in his position as an Extension Service specialist at Rutgers over a period of years. Not only does he know many individual

growers, he is familiar with sod production as an industry.

Ben O. Warren, Warren Turf Nurseries, Palos Park, Ill., outgoing president will continue to serve as a director. He had served 18 months as the only president of the ASPA. Elected president for the coming year is Wiley Miner, Princeton Turf Farms, Princeton, N.J. Miner had pre-

viously served as a director. Besides Miner, new officers elected were: Tobias Grether, Cal-Turf, Inc., Camarillo, Calif., vice-president; Jack Kidwell, Kidwell Turf Farms, Culpeper, Va., treasurer and director; and Jim Ousley, Ousley Sod Company, Pompano Beach, Fla., secretary. Other directors who will continue to serve are: Robert Daymon, Em-

ASPA officer slate, left to right: Tobias Grether, vice-president; Wiley Miner, president; Jack Kidwell, treasurer; Henry W. Indyk, executive-secretary; Jim Ousley, secretary; Ben O. Warren, director; and Robert Daymon, director.





Nunes sod harvester in operation at Resmondo farm, first tour stop made by growers. Some 1300 acres of sod is grown yearly in this operation.



Jim Ousley, left, and W. W. (Woody) Resmondo served as hosts to visitors.

chairman of the department of Ornamental Horticulture, discussed coming research at the Florida Station. He stressed the need for research in 11 specific areas of the turf industry.

First on the list by Roberts was the need for improved chemical control of turf growth. Chemicals for use on turf, he said, have not been as promising as those for other plant types. But as we learn more about the growth processes in grasses, Roberts pointed out, we may be able

erald Valley Turf Nurseries, Howell, Mich., and Louis DeLea, DeLea & Sons, East Northport, Long Island, N.Y. Richard Horner, Horner Sod Farms, Wind Lake, Wis., resigned as a director, with Kidwell succeeding him on the board.

Formal Session and Show

Growers spent the first day of their meeting in formal educational sessions. The range of soil and water management, insect and disease control, and weed problem solving was covered by research and teaching staff members of the University of Florida, Gainesville. Dr. Eliot C. Roberts,

Princeton sod harvester was demonstrated at Ousley sod farm. Operating harvester is Vince Grubb, field foreman at Princeton Sod Farms.



to use chemicals to slow down or speed up growth depending on the response desired.

Roberts also expects more selective herbicide use. Since herbicides are growth regulators of one type or another, he said, they exhibit a selective effect on plant type.

He also discussed water use and turf cultivation and the expected new knowledge in these areas. Emphasized also by Roberts is the coming promise of computerized management. We are living in a computer age, Roberts stated. The turfgrass manager with significant input data at his disposal can make good use of computer data, he believes. In this area Roberts listed inputs such as soil test data, leaf tissue test data, grass data, weather history, turf quality required, and normal cultural practices such as mowing practices, irrigation, and pesticide use. With these data properly weighted and fed into a computer, the equipment can be programmed to predict turf response and ultimately lead to control of quality of grass produced. Research is needed, Roberts said, to develop the specific programs and standard methods to make such computer use practical.

Besides the educational program, growers attending the annual meeting had ample time to attend the massive trade show staged by the Golf Course Superintendents. This Trade Show was a part of their 40th International Turfgrass Conference and Show. The ASPA holds its annual sessions in conjunction with the golf superintendents. The show as always, included major exhibits by more than 120 suppliers and manufacturers.

Tour of Florida Sod

Charter buses were used to transport visitors to the Resmondo and Ousley sod operations. During the course of a day-long tour growers also had opportunity to visit a sugar refinery

Automatic sod pick-up, 54"x96", manufactured by Stanco Midwest Sales, Inc., Chicago, Ill., was demonstrated at Ousley farm during tour.



and see some truck crop operations.

Sidelights to the formal meeting and tour were special demonstrations of equipment. Princeton Turf Farms showed Princeton Sod Harvester. This unit was demonstrated on sod at one of the farms of Jim Ousley. Visitors also saw the Nunes Harvester in operation during the tour of the Resmondo Sod Farm.

Don Morrill, president of Shamrock Turf Nurseries, Inc., at Hanna, Ind., announced at a special breakfast meeting that

his sod harvester, the "Big J," will now be manufactured and marketed. On hand with Morrill to present movies of the unit in operation were Fred Hartman, Shamrock nursery manager at the Hanna Farm, and Ray Johnson, general products manager at Momence, Ill., where the harvester will be built.

The Morrill unit picks up and rolls 1500 yards of sod per hour and operates with pallets. It is hydraulically operated and will handle all popular lengths and widths of sod, according to Morrill.

AMERICAN SOD PRODUCERS ASSOCIATION invites your participation

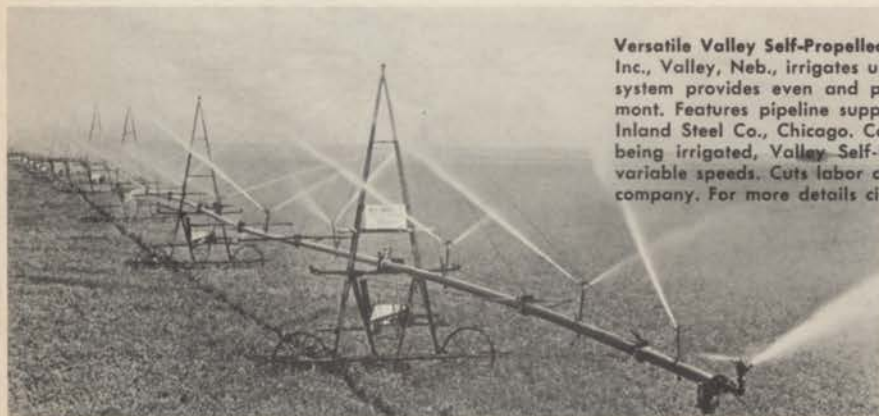
If you are a Sod Grower you should be
a member of ASPA.

Keep in touch with progress.
Allied Industries are welcome.

For More Details Circle (115) on Reply Card

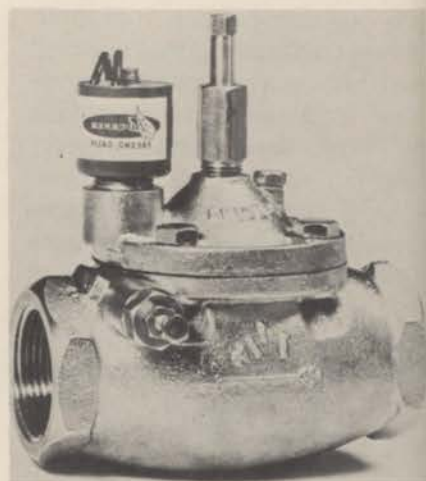
New Products . . .

Designed for the Irrigation Specialist

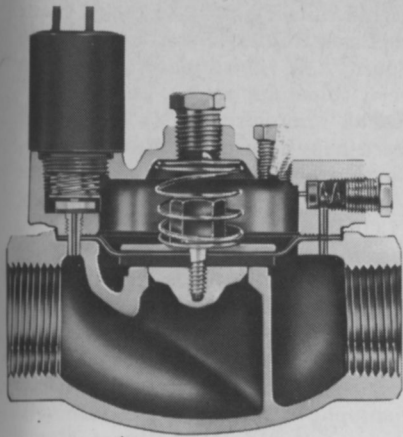


Versatile Valley Self-Propelled Irrigation system produced by Valmont Industries, Inc., Valley, Neb., irrigates up to 180 acres. In constant motion while operating, system provides even and precise coverage without wasting water, says Valmont. Features pipeline supported by mobile towers of steel sheet supplied by Inland Steel Co., Chicago. Connected to main feed-water line in center of area being irrigated, Valley Self-Propelled system revolves around central point at variable speeds. Cuts labor costs, requires only set-up plus routine upkeep, says company. For more details circle (704) on reply card.

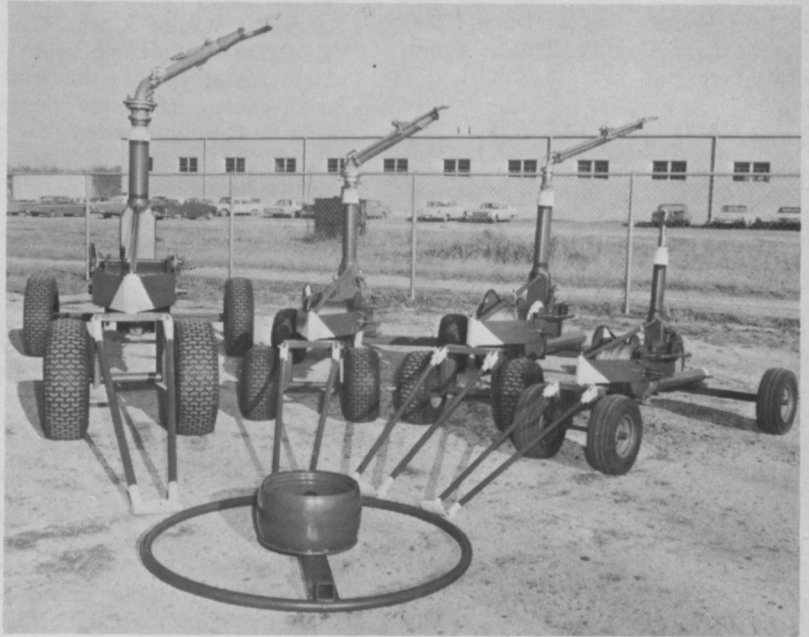
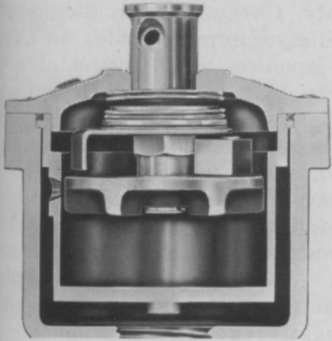
Buckner Sprinkler Company, Fresno, Calif., reports its new pressure regulator control valve provides completely automatic regulation to maintain uniform water discharge pressure and flow in irrigation systems. Valves can be set at desired operating pressures up to 150 PSI; they provide high degree of uniformity from all sprinklers on a given system regardless of location, according to Buckner general sales manager, Howard F. Smiley. For more details circle (705) on reply card.



ITT Marlow, Fluid Handling Division, International Telephone and Telegraph Corp., Midland Park, N. J., offers its new high-capacity, self-priming centrifugal pump. Designated 2H19, the unit has 2" suction and discharge connections and can achieve flows as high as 9600 g.p.h. with total head capacity exceeding 100 feet, says ITT Marlow. Unit also features rapid priming and can operate at suction lifts up to 25 feet, according to the company. Powered by 3-HP, air-cooled engine, 2H19 weighs only 60 lbs., can be carried by one man. Priced under \$150. For more details circle (706) on reply card.

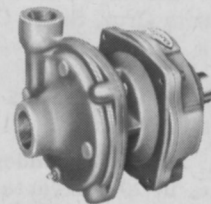
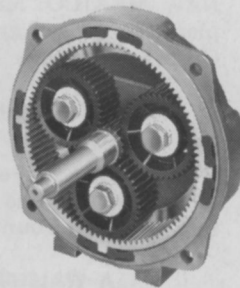


Weather-matic Sprinkler Division, Telsco Industries, Dallas, Tex., has introduced a new low-amperage solenoid for their No. 8024 Electro-Val plus a new series of pop-up rotary sprinklers. The company reports its water-proof solenoid (top, left) has spring-loaded actuator to permit mounting of valve in any position. Series 040 pop-up sprinkler (bottom, left) is designed for medium turf areas at lower operating pressures. In full, half or quarter circle, the unit operates at pressures from 25 to 50 PSI, has nozzle range of 56 to 65 feet. Body is high-impact Cycloy plastic with brass cover; internal parts are removable from above ground for easy cleaning and adjustment, says Weather-matic. For more details circle (707) on reply card.



General Irrigation Co., Carthage, Mo., has added 3 new models to its E-Z RAIN line: Mark-2 irrigates 40 acres, operating at 100-200 GPM; Mark-3 discharges 200-400 GPM, irrigating 80 acres; Mark-6, newest and largest E-Z RAIN unit, uses 800-1600 GPM and irrigates 320 acres, according to General Irrigation. The original Mark-4 unit now uses 400-800 GPM, irrigating up to 160 acres. E-Z RAIN models, all featuring exclusive water turbine drive with by-pass variable speed control, offer advantages such as low maintenance costs and ability to irrigate narrow or odd-shaped areas, says the company. For more details circle (708) on reply card.

Rain-Spray, Los Angeles, is offering a sprinkler kit that allows the "Do-It-Yourself" to easily install his own underground system by "adding on" as many units as needed, says the company. Its RSK-300 Add-On Kit provides a system that covers up to 800 sq. ft., able to water lawns of all shapes. Kits include all necessary parts and fittings, 100 feet of sprinkler pipe and installation manual. Rain Spray says its system connects directly to any 3/4" or 1/2" hose outlet, requiring no special tools. For more details circle (710) on reply card.



Hypro, Inc., St. Paul, Minn., recently introduced its new tractor-driven centrifugal pump with compact, planetary gear drive. Designated Series 9000, the pump's gear drive increases pump speed 7 times for standard PTO shafts, delivers up to 114 GPM with pressures up to 60 lbs. per sq. inch, according to Hypro. Used enclosed gear drive instead of belts or chain drive offers added safety and more trouble-free operation, Hypro contends. During tests, the 6-HP, cast-iron pump withstood more than 15,000 abrupt stops and starts without evidence of wear, Hypro attests. For more details circle (709) on reply card.

Insect Report

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

TREE INSECTS

AN APHID

(*Capitophorus patonkus*)

UTAH: Collected (probably on *Achillea*) at Cedar Breaks National Monument at 10,000 feet elevation in Iron County and at Duck Creek Camp, Kane County. This is a new State record.

BERMUDAGRASS MITE

(*Aceria neocynodonis*)

CALIFORNIA: Medium on Bermudagrass at Anderson, Shasta County. This is a new county record.

AN ARMORED SCALE

(*Diaspis dignus*)

FLORIDA: Taken on button-snakeroot (*Eryngium yuccifolium*) at Samsula, Volusia County, for a new Florida Department of Plant Industry host record.

TURF INSECTS

AN APHID

(*Lachnus salignus*)

ARIZONA: Heavy on willows at Tempe area, Maricopa County.

A BARK APHID

(*Pineus sp.*)

CALIFORNIA: Infesting Coulter pines in a plantation and pine reproduction in Fay Creek Plantation and adjacent area of Cleveland National Forest. About 60 trees in 2-acre area show damage; infestation increasing.

A CONIFER APHID

(*Cinara occidentalis*)

CALIFORNIA: Medium on fir nursery stock at Santa Cruz, Santa Cruz County.

CALIFORNIA FIVE-SPINED IPS

(*Ips confusus*)

CALIFORNIA: About 30 ponderosa and sugar pines in 10-acre area infested at Sweetwater Point, Mariposa County. Thinning operations responsible. Infestation increasing.

A MARGARODID SCALE

(*Neosteingelia texana*)

FLORIDA: Taken on hickory (*Carya sp.*) near Santa Fe River, Columbia

County, for a new Florida Department of Plant Industry host record.

PINE NEEDLE SCALE

(*Phenacapis pinifoliae*)

CALIFORNIA: Widespread on ponderosa pines in Tennant Road of Goosenest Ranger District, Klamath National Forest. Medium on twigs on spruce trees locally in game reserve at Tulelake, Suskiyou County. Prevalent past several months in many areas in forests.

SOFT SCALES

CALIFORNIA: *Mycetococcus ehrhorni* heavy on live oaks at Lafayette, Contra Costa County. FLORIDA: *Pulvinaria psidii* (green shield scale) taken on Australian brush-cherry (*Eugenia paniculata*) at Taft, Orange County, for a new Florida Department of Plant Industry host record.

INSECTS OF ORNAMENTALS

A BARK BEETLE

(*Phloeosinus cupressi*)

CALIFORNIA: Adults heavy on Monterey cypress nursery stock at Danville, Contra Costa County.

DOGWOOD BORER

(*Thamnospehia scitula*)

ALABAMA: Larval feeding increased in cambium layer of many dogwood trees past 10-15 warm days statewide. Increased larval feeding and movement attracted birds. Much fresh "pecking" injury to bark. Many older infested spots on older trees have 2-15 larvae.

A MEALYBUG

(*Spilococcus pressus*)

CALIFORNIA: Heavy on oleander at Brawley, Imperial County.

SPIDER MITES

(*Tetranychus spp.*)

NEW MEXICO: Moderate on house plants in several greenhouses at Las Cruces area, Dona Ana County.

NANTUCKET PINE TIP MOTH

(*Rhyacionia frustrana*)

OKLAHOMA: Live pupae in 75 percent of young pine tips on roadsides in McCurtain County.

A WALSHIID MOTH

(*Periploca nigra*)

CALIFORNIA: Adults and larvae medium to heavy on juniper nursery stock at San Luis Obispo County.

ARMORED SCALES

CALIFORNIA: *Diaspis boisduvalii* medium week ending January 10 on

orchid nursery stock in orchid house at Paso Robles, San Luis Obispo County. *D. boisduvalii*, *Aspidiotus nerii* (oleander scale), and *Pseudococcus microcirculus* (a mealybug) were heavy on cymbidium and cattleya orchards in orchid house at Menlo Park, San Mateo County. FLORIDA: All stages of *Fiorinia theae* (tea scale) severe on all 100 lusterleaf holly plants in nursery at Glen Saint Mary, Baker County. The following were collected in 1968 for new Florida Department of Plant Industry host records. *Abgrallaspis cyanophylli* on asparagus-fern (*Asparagus plumosus*) at Stuart, Martin County. *Chrysomphalus dictyospermi* (dictyospermum scale) on *Cleyera japonica* at Williston, Levy County. Mature scales of *Ceroplastes floridensis* (Florida wax scale), some with eggs, severe on 1,320 container-grown plants of Burford holly in Nursery in Hillsborough County. The following are new Florida Department of Plant Industry host records. All stages of *Lepidosaphes beckii* (purple scale) on variegated elaeagnus (*Elaeagnus pungens*) at Raiford, Union County. This is a new county record. *Aspidiotus juglansregiae* (walnut scale) adults on stems of honeysuckle (*Lonicera heckrottii*) in nursery at Gainesville, Alachua County.

BROWN SOFT SCALE

(*Coccus hesperidum*)

CALIFORNIA: Heavy on orchids in orchid house at Larkspur, Marin County.

Compiled from information furnished by the U. S. Department of Agriculture, university staffs, and WTT readers. Turf and tree specialists are urged to send reports of insect problems noted in their areas to: Insect Reports, WEEDS TREES AND TURF, 9800 Detroit Ave., Cleveland, Ohio 44102.

Whitehead Tells Dow Story

Don Whitehead, twice a Pulitzer Prize winner for reporting, has written a history of the Dow Chemical Company entitled "The Dow Story." Using a blend of anecdote and straight reporting, Whitehead traces the growth of the Midland-based (Michigan) company from its founding in 1897 to its present status as one of the world's leading chemical enterprises.

Published by McGraw-Hill Book Company, "The Dow Story" is priced at \$5.95.

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.

HELP WANTED

BARTLETT TREE EXPERTS OFFER EXCEPTIONAL OPPORTUNITY



This nationally known tree service company, which operates from Maine to Florida, offers outstanding career opportunities in sales and management for men experienced in the tree field or college graduates in forestry, horticulture or agriculture. Ability to work with public and personnel is important. Attractive salary plus commission, protected territory, growth potential excellent. Intensive training course and benefits. Send resume of education or experience to William Eckhardt, Bartlett Tree Experts, 2770 Summer Street, Stamford, Conn. 06905.



USED EQUIPMENT

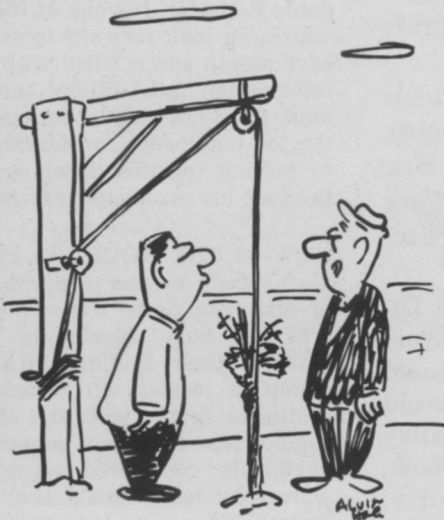
HIGHWAY WEED-BRUSH sprayer, Hardie 1000-gallon R. S., 25-gallon min. pumps, custom built, spray boom right or left hand. One man operated, all controls inside cab. Can spray 8-10 miles per hour. Complete, mounted on International 1967 2-speed, special truck. Terms: Cash. Ray E. Goodell, RD 1, Conklin,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

REINCO HYDRO Seeder, Model H SJ10WX, 60 HP Wisc. Engine. Unit has been used to apply 4 tankfuls. Some attachments never used. Change in plans make this surplus

BUSINESS OPPORTUNITIES

PROFITABLE, established lawn and tree spray service with outstanding potential. Substantial repeat business. Gross profit potential from \$17M to \$31M with present equipment. Ideal for 2 partners. Priced low for quick sale. Owners have other interests. Complete details available. General Spray Service, 390 Prospect St., East Hartford, Conn. 06108.

FOR SALE: Going business, personal property, sod acreage and peppermint acreage with long term land lease. Will consider share cropping. Box 39, Weeds, Trees & Turf, 9800 Detroit Ave., Cleveland, Ohio 44102.



"STRETCHING IT WON'T MAKE IT GROW FASTER."

HELP WANTED

TURF MANAGER or assistant. A rare opportunity to work with and/or buy into a fast growing turf farm developing fine bluegrass sods in Fort Wayne, Indiana. Excellent salary and a beautiful home available on farm. Must have references and experience with muck turf. Phone or write Spring Lake Farms, Hoagland, Indiana 46745. Phone 219 639-3012.

USED EQUIPMENT

equipment. Bargain, \$3,000. Gulf Reston, Inc., Executive Office, Reston, Va. 22070. Phone 471-4307, Ext. 50.

LAWN SPIKER, 7 ft., 3 sections, \$120.00; Seaman Tilter, 6 ft., Waukeska, 6 cylinder motor, trailer mounted, \$425.00; Huber roller, 8-ton, 3-wheel, \$450.00. Gettemeyer Sod Farm, R.R.2, St. Peters, Mo. 63376. Phone 314 278-3388.

SPRAYERS, chippers, log splitters and other equipment at large savings. Let us know your needs.

Advertisers

INDEX TO ADVERTISERS

Amchem Products, Inc.	4
American Sod Producers Association	43
Asplundh Tree Expert Co.	47
Beck Manufacturing Co.	3rd Cover
Buckner Industries, Inc.	5
Chevron Chemical Co., Ortho Div.	11
Colloidal Products Corp.	4th Cover
E. I. duPont de Nemours & Co., Inc.	13
Elanco Products Co.	24, 25, 26
Febco, Inc.	39
W. J. Heinrich, Inc.	34
Howard Rotavator Co.	31
H. D. Hudson Mfg. Co.	21
International Harvester Co.	16, 17
Jacklin Seed Co.	48
Locke Manufacturing Companies, Inc.	31
John Nunes Mechanical Harvesting Co.	2nd Cover
Ra-Pid-Gro Corp.	18
Sabre Saw Chain, Inc.	18
Slope Tractor Co.	35
Stihl American, Inc.	33
Velsicol Chemical Corp.	7
Wayne Manufacturing Co.	37

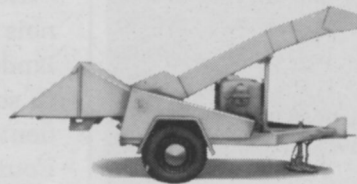
USED EQUIPMENT

Equipment Sales Company, 4744 Sunrise Highway, Massapequa Park, N. Y. 11762.

FOR SALE: 1968 Dunbar hydraulic sod unloader, Model C-101 360° Swing, used 3 times. Huron Sod Farms, Inc., 30877 Pennsylvania Rd., Romulus, Michigan 48174.

SPRAYER, for fertilizer, etc. agitator, 50-gallon tank, 5-horsepower motor, on skid. Top shape, \$150. Golf, 26297 Baseline, Highland, California 92346.

The chipper was conceived, researched, designed and field-proven by Asplundh, the world's largest tree expert company...



... but, unfortunately, not all chippers are Asplundh Chippers.

In other words, don't settle for less than an Asplundh. Your comparison of our Model J 16" Trailer Chipper with anything else on the market will prove it at least eight ways better.

Let us prove it. Just ask for a free, no-obligation demonstration when you write for the illustrated specifications brochure "Asplundh Chippers to Fit Your Need".

ASPLUNDH CHIPPER COMPANY

HAMILTON STREET
CHALFONT, PENNA. 18914

MANUFACTURING DIVISION
OF THE ASPLUNDH TREE EXPERT CO.

THE CHIPPER WITH THE TRADEMARK



For More Details Circle (123) on Reply Card

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 (110) on Reply Card

Firm Offers Harvesters For Aquatic Plant Control

Aquatic Controls Corporation has developed a line of high-speed, self-contained harvesting machines to alleviate aquatic vegetation problems without damaging ecology of the waterway, it reports.

Excessive aquatic vegetation is caused by excessive fertility from lawns, gardens, farms and even processed sewage, says the company. This situation can be remedied by removing the unwanted plants, prior to their full maturity, according to Aquatic Controls. Harvested plants can then be converted into organic fertilizer, the company believes.

For more details write the company (Waukesha, Wis. 53186) for a copy of "Water Pollution, Cause & Control," an available report prepared by Howard W. Stern, president of Aquatic Controls.

Illinois Group Re-Elects Bob Johnson As President

Robert G. Johnson of the Illinois Lawn Equipment, Inc., Orlando Park, was recently elected to serve a second term as president of the Illinois Turfgrass Foundation, Inc.

Oscar Miles of Olympia Fields Country Club, Olympia Fields, was elected vice president; Mrs. Dorothy Carey of Orlando Park was re-appointed Executive Secretary-Treasurer.

The association's Board of Directors are: Ben Warren, Warren's Turf Nurseries; Ronald Damgaard, Landscaping; Harold Frederickson, Edgewood Valley Country Club; Tom Guttschow, Lincoln Greens Golf Course; Walter Fuchs, The Upjohn Company; Leon Short, Leon Short & Sons, Inc.; and Vernon Verstraete, Wewanee Park District.

Trimmings

VACATION OR MEETING? During the past 3 months we've covered a variety of meetings. Locations of most of these are exemplary — if the purpose is to meet at a playground. Three have been in Florida and two in Las Vegas. Expenses, particularly in Florida, are ridiculous during the winter months. With the company footing the bill, we can't complain. But it may be to the point that costs are adversely affecting attendance.

* * *

HOW MUCH CAN GOVERNMENT RESTRICT INDUSTRY? We find the recent remarks of FMC Corporation's Edward K. Hertel very revealing. He points out that government agency requirements on new product development are stiffening. Pesticide developers, he said, are being required to probe ever deeper into toxicology regarding proposed new pesticides. This can adversely affect development in 2 ways: (1) only companies with big research budgets can survive the tremendous expense in putting a new compound on the market; and (2) new requirements may preclude development of specialty products for limited acreage crops.

* * *

UNSUNG HEROES. We have a sympathetic interest in those stalwart association secretaries who faithfully produce newsletters for the membership. Had a nice visit with one who is typical recently at Miami Beach. He is Stan Metsker, course superintendent at the Boulder CC, Boulder, Colo., and he produces a timely sheet called the Rocky Mountain Golf Course Superintendents Reporter. It's one of the many which we look forward to receiving each month and is filled with timely information. Like others across the land, Stan not only is serious about the job but spends considerable time in pulling together local news and keeping his associates informed.

* * *

NOW IS THE HOUR. We can only wish speedy success to entomologists at Michigan State University. Several are busy developing further data on their findings that tiny, primitive insects will break down pesticides in the soil. The chemical compounds are then converted to chemicals considered harmless to warm-blooded animals and helpful insects. Their hope is to literally put a built-in pesticide "clean-up" system into the soil. Working on the process are: Dr. James Butcher, Erik Kirknel, and Dr. Matthew Zabik.

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



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

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

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



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

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

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

The U.S. Patented Lawn-O-Matic is available in 1, 2, or 3 row machines and is priced at only \$795.00. This machine was developed by Alabama's largest grower of sod.

Write Box 752, Auburn, Alabama for more information.

Inquiries from manufacturers representatives and distributors invited. Beck Manufacturing Co. • Box 752 • Auburn, Alabama 36830 • Phone 205/887-6757.

BECK MANUFACTURING CO.

For More Details Circle (119) on Reply Card

Meeting

Dates

Southern Turfgrass Association, Annual Conference, Sheraton - Peabody Hotel, Memphis, Tenn., Mar. 3-4.

Midwest Regional Turf Conference, Purdue University, Lafayette, Ind., Mar. 3-5.

Maryland Sod Conference, University of Maryland, College Park, Md., Mar. 5.

Regional Lawn & Garden Retailers Day, New York Cooperative Extension Service, Holiday Inn, Fishkill, N.Y., Mar. 5.

Annual Fine Turf Conference, University of Massachusetts, High Point Motor Inn, Chicopee, Mass., Mar. 5-7.

Southern Shade Tree Conference, Southern Chapter, I.S.T.C., Holiday Inn, Pine Mountain, Ga., Mar. 9-12.

Iowa Turfgrass Conference, Annual Conference, Roosevelt Hotel, Cedar Rapids, Ia., Mar. 10-12.

North Carolina Turfgrass Conference, N.C. State University, Faculty Club, Raleigh, N. C., Mar. 11-12.

Michigan Turfgrass Conference, 39th Annual, Kellogg Center, Michigan State University, East Lansing, Mich., March 12-13.

Midwinter Turf Conference, University of Maine, Steer Inn Motor Lodge, South Portland, Me., Mar. 19-20.

Northern California Turfgrass Exposition, 5th Annual, Pavilion Building, Santa Clara County Fairgrounds, San Jose, Calif., Mar. 19-20.

Turfgrass Growers Seminar, Rhode Island Annual, Memorial Union, University of Rhode Island, Kingston, R.I., Mar. 21.

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

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

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

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

For More Details Circle (120) on Reply Card



THE COMPATIBILITY
AGENT THAT KEEPS
LIQUID FERTILIZER-
PESTICIDE MIXTURES

all stirred up.

COMPLEX is the compatibility agent that assures uniform distribution of the mixture. It is essential if the equipment used has poor or no agitation. It's even helpful when using equipment with good agitation. For more information ask your Ag Chem Supplier or write:

Colloidal, Box 667, Sausalito, CA 94965