

Costs of irrigation, pumps and associated pumping equipment must also be calculated into the overall production expenses.

A Sod Producer's Two Goals

By RICHARD E. SCHMIDT

Associate Professor of Agronomy
Virginia Polytechnic Institute
Blacksburg, Va.

A SOD producer has two major objectives. The first is providing a quality sod and the second is to produce the sod efficiently, which means as rapidly as possible.

In meeting the first objective the sod producer is handicapped to a large extent. Information on adaptability is lacking on the many varieties and strains he may choose to grow. Many strains and selections are released without knowledge of particular environmental adaptability.

Many times a grass may be well adapted to the conditions existing at the sod farm, but will not tolerate the usage, management or environment of the area on which it is eventually installed. Information concerning the response of specific varieties to specific ecological conditions would be desirable and most helpful in selecting strains and formulating mixture and blends in order to produce a quality sod.

Attempts are being made in the northeast to obtain this type of information on the various Ky bluegrass cultivars. Experiment stations from Vermont to Virginia are cooperating in evaluating the commercially available as well as many of the promising experimental varieties and strains.

Efficiency of production involves the interrelationships of the turfgrass physiology, morphology and environmental conditions.

Sod strength or rolling ability indicates when a sod is ready for harvest. In essence this is directly related to the development of roots and rhizomes.

The roots of cool season grasses generally renew themselves from November to April, with the most rapid root development occurring in April. Little root growth can be expected during the summer months.

Cool season grass rhizome initiation is not dependent upon cold weather as often is thought since most rhizome formation occurs in the spring.

Rhizome development is associated with the long day and short phenomenon of spring, independent of exposure to low temperatures. The production of roots and rhizomes in the spring is the main reason sod is not considered harvestable until the grass overwinters regardless of season established.

In some areas, similar to those found in Michigan, sod can be produced more rapidly than in other areas, such as here in the mid-Atlantic area.

This is often puzzling because here we have longer growing weather in the fall and early springs than are experienced in Michigan. Their advantages are associated with the organic soils on which they grow sods.

These muck soils have a high water holding capacity, and a tre-

mendous nutrient holding capacity. Seldom are these soils lacking in moisture and often are saturated for long periods of time. This forces mass root development near the soil surface.

Now, it's not advocated that soils be continuously saturated to develop large quantities of roots near the surface, but my observation is that most sod fields in the east are under irrigation.

Information is needed on when and how to irrigate mineral soils to best produce root development for sod production. It appears that excess water at the wrong time reacts like excess nitrogen at the wrong time.

Less companion grass should be incorporated in Ky bluegrass mixtures seeded in spring than in the fall.

All year old sod containing a companion grass was weaker than pure Ky bluegrass sod. The companion grasses in order of reducing sod strength were as follows: perennial ryegrass > annual ryegrass > creeping red fescue > redbud. However, the rooting ability was enhanced, to a certain extent, inversely with sod strength.

Possibly this information may be used by sod growers in formulating seeding mixtures to obtain sod strength quickly as well as providing a rapid knitting sod.

Ohio Sod Growers Organize New Group

Ohio sod growers, meeting in conjunction with the recent Ohio Turfgrass Foundation annual at Cleveland, formally organized an Ohio Sod Growers Association. Potential for the group will be more than 80 growers plus supplier membership, for which there is a category.

John R. Kramer, Kramer & Sons, Westlake, was named president by the group. Other officers are: Chester Augspurger, Cincinnati

Turfgrass Nursery, Inc., vice-president; Dr. Robert W. Miller, The Ohio State University, secretary; Don Figurella, Best Turf Sod Farm, North Canton, treasurer; and directors, Cecil Collings, Green Valley Turf Farm, Youngstown, Woodrow Wilson, Eastside Nurseries, Inc., Canal Winchester, and Jack Schiller, Haywood, Inc., Oak Harbor.

Kramer reports that both Class A and Class B memberships are available at \$50 per year for each. Growers are eligible for Class A, and businessmen suppliers for the Class B category.

First meeting of the Board following the organizational session is scheduled for 12:00 noon, Jan. 25, at Columbus, O. Data on this session and memberships are available from either Kramer (24617 Center Ridge, Westlake, Tel. 871-4092) or from Dr. Miller (1827 Neil Ave., Columbus, 43210).

Plants Vital; But Can't Solve Pollution

Green plants such as ornamentals and turfgrass can be valuable in improving environmental conditions, but the plants should not be considered as a cure-all remedy.

Dr. V. B. Youngner, head of turfgrass research at the University of California, said many of today's ecologists are overestimating the effectiveness of turfgrass and ornamentals because they don't have the facts. He says that there are two major fallacies concerning green plants and pollution.

One is that plants will purify the air as it passes through them. He pointed out that some filtering does occur, but only in the gases that actually pass through the plant. As an example, Youngner said that polluted air might be several thousand feet high but wouldn't be filtered very well by a turf that might be only a couple of inches high.

Another misconception is that the production of oxygen by green plants will salvage the quality of the atmosphere.

"Certainly oxygen is given off by the plants, but there is no shortage of oxygen. The problem is one of pollutants in the atmosphere," Youngner commented.

Vegetation can play a very vital role in prevention of air pollution by dust and other particles, according to speaker Youngner.

People involved in turfgrass management have better opportunities to

solve water pollution problems. Youngner described systems where sewage water is sprayed on golf courses or ornamentals so that it can filter back into the ground water supply. By the time it filters into the ground, there should be no problems such as those occurring with direct dumping or run-off situations.

"People involved in the management of turfgrass and ornamentals have been environmentalists long before the word became so popular," Youngner said. "They have an important role but they must perform it from the position of understanding their actions and being careful to avoid any new contaminant problems."

In southern California, studies are underway using vegetation to establish "green belts" along mountain sides. The belts would aid in water conservation, disposal of sewage water, fire prevention or retardation, and recreation. Other research is determining the effect of different moisture levels on plants native to the region and the feasibility of establishing introduced species.

Definition of A Farmer

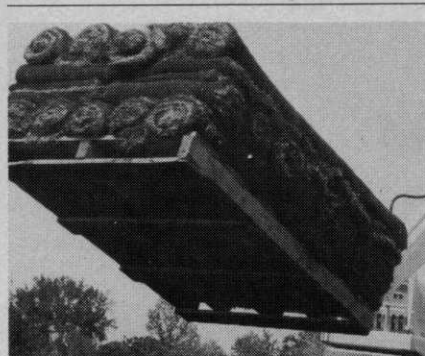
Who is a farmer? That's the question the Florida Project Agriculture Advisory Committee faced. To answer this, members of the committee, chaired by James F. Griffin, Jr. executive vice-president of the Florida Nurserymen and Growers Association Inc., took many things into consideration.

A state-wide study was made for adjusting agricultural education and training programs so that they will better meet the needs of the Florida agricultural industry.

The committee defined a farmer as a land owner, operator, renter, lessor, or sharecropper who cultivates land. He is one who on 10 acres or less realizes at least \$50 per acre gross income, or on more than 10 acres returns at least a total of \$270 gross income from his farming operation.

Acreage of land is not necessarily a good criterion for deciding who is a farmer, said Griffin. Total man months of labor required and total income received from farming operations in a given year are better, but not complete.

"For example what about the person who has a crop failure due to drought or pests? What about the fellow with a half acre of land who makes a good livelihood raising watercress?" Griffin said.



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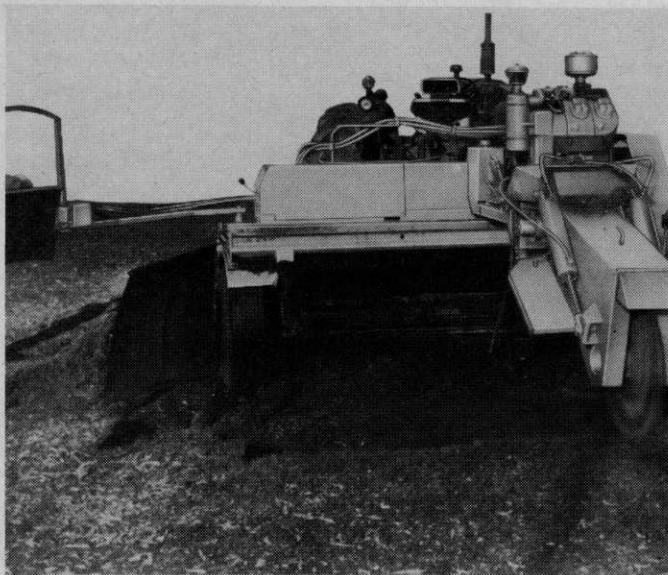
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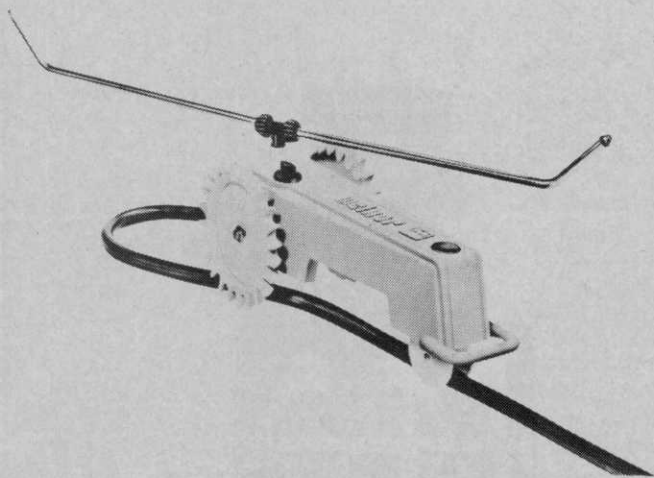
BRUSH CHIPPER: M-B Company, New Holstein, Wis.

M-B Fitchburg chippers are available in three models, handling round wood sizes up to 7" in diameter. A unique, spring-activated feed plate adjusts to various wood sizes, eliminating the need for a feed plate. Many communities are using chippers in brush and tree removal instead of burning. This reduces the hazards of air pollution and chips can be easily disposed. For more details, circle (701) on the reply card.



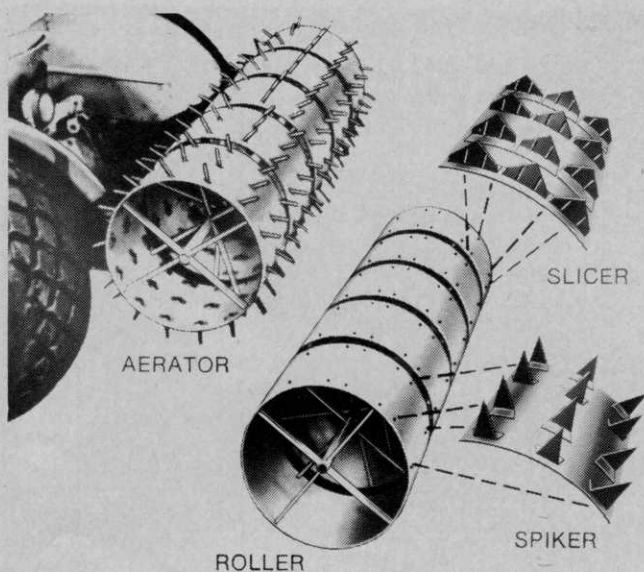
STUMP CUTTER: Vermeer Manufacturing Co., Pella, Ia.

An exclusive "reach-out" cutting wheel which hydraulically extends into tight spots (next to walls, buildings, trees, etc.) is a feature of Vermeer Model 2460A, a 65 hp stump remover. Its "straight across" cutting movement slices a swath 24" deep, more than 72" wide. A new swing tongue adds even greater range to the unit's cutting ability by hydraulically telescoping and swinging the tongue — left or right — to allow pinpoint positioning without moving the vehicle. The machine is also available in a 36 hp unit. For more details, circle (702) on the reply card.



THE CRAWLER: Melnor Industries, Moonachie, N.J.

The Crawler, Melnor's newest traveling sprinkler, can pull up to 300 feet of 1/2" hose as it moves. It is precision engineered and designed with proper weight distribution so that the guide wheels hug the hose to keep it on course, regardless of the hose position. The Crawler has a 2 speed, 3 position control for fast, slow or stationary sprinkling. Ultra-wide spray arms are adjustable for variable sprinkling widths from 5 feet to 60 feet. Automatic shut-off is accomplished with Melnor's special shut-off valve, available for use with all Melnor traveling sprinklers. For more details, circle (703) on the reply card.



DEDOES AERATOR: Dedoes Industries, Berkley, Mich.

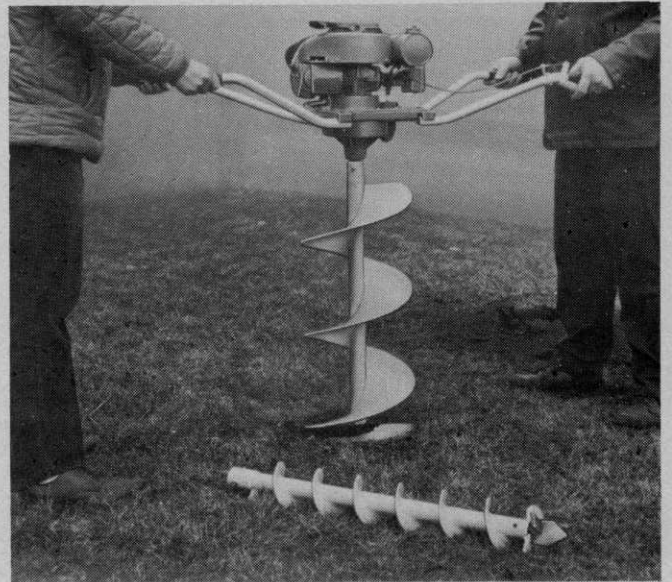
Here's a new turf maintenance system which makes two attachments do the work of four. Complete system includes an aerator unit which removes 180 plugs per revolution; an ingenious new 3-in-1 convert-a-unit which may be used as a roller; as a slicer (by attaching slicer plates); and as a spiker (by attaching spiker plates); the conversion unit utilizes the weight of the tractor for down force. A model is also available for use with smaller tractors. This unit takes a swath 42 inches wide and pulls 108 pluggers per revolution. For more details, circle (704) on the reply card.





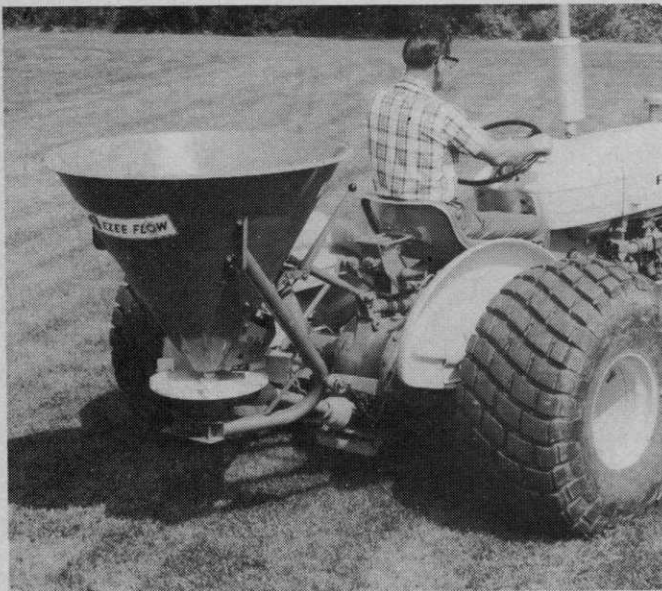
LONG-REACH BOOM LOADER: New Holland, New Holland, Pa.

A new utility loader with the longest reach in its class and with a combination of hydrostatic drive and power steering is now available. Model L-35 has an SAE operating load of 1,800 pounds with rear weights. It features a boom system which extends the reach of the loader bucket as it rises higher. Included on the unit are a bucket level indicator, boom locks to keep the boom safely in the "up" position and an operator's cab built in as an integral part of the loader. It can turn in its own length. For more details, circle (705) on the reply card.



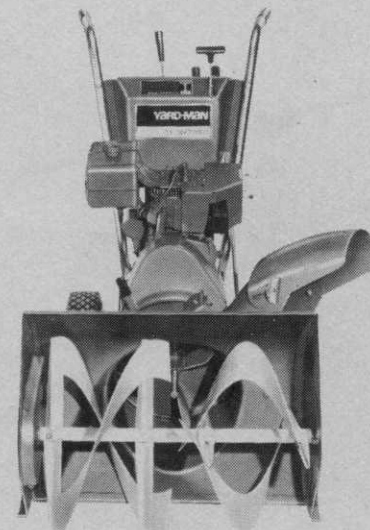
AUTO-DIG: Vogel Tool and Die Corp., Stone Park, Ill.

Auto-Dig is a new, low-cost, lightweight, portable power hole digger. Developed for heavy duty use. It has many excellent applications in landscaping, ranching, utility companies, and highway departments. The unit is equipped with a 5 hp, two cycle, air cooled engine and easy recoil starter. A dead man throttle control is mounted on easy-grip handlebars that are tilted to operate in a natural hand position. Vogel Auto-Dig is available in two models. For more details, circle (706) on the reply card.



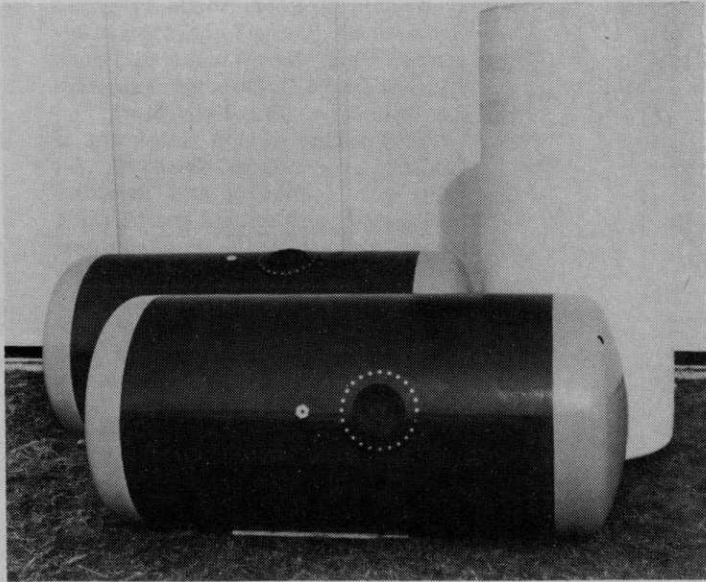
THREE POINT HITCH SPREADER-SEEDER: Ezee Flow, Coldwater, Ohio

Three-point hitch spinner spreader-seeder is designated the No. 106. Single spinner machine is designed to accurately and uniformly spread granular, pelleted and semi-granular fertilizers and most seeds, at rates ranging from 4 to 1,570 pounds per acre. Spread controlled from the tractor seat. Maximum effective spread width is 36 feet. Hopper, of 12-gauge formed steel, holds 690 pounds, or 8.5 bushels. Blades on spinner are adjustable, and shutters are nylon-faced. For more details, circle (707) on the reply card.



SNOWBIRD, YARD-MAN: The Leisure Group, Inc., Jackson, Mich.

Two new Snowbird® snowthrowers, a 5 horsepower, 24-inch model 7090 and the 7 horsepower, 26-inch model 7100 are now available. They feature 5 forward speeds plus reverse, a "Turret Action" discharge chute, and simplified controls. Both models are equipped with free-wheeling control which enables the release of power to the drive wheels while auger and impeller continue to run. They are powered by winterized Tecumseh 4 cycle engines with optional 110 volt electrical starting. For more details, circle (708) on the reply card.



FIBERGLASS TANK: Raven Industries, Sioux Falls, S. Dak.

Seamless interior and centrifugally molded fiberglass are the features of this 60-inch diameter tank. The new tank can be used as a nurse tank or mounted on a truck applicator. It also can be used for stationary storage of chemicals. Tank size is available in 1000 to 1500 gallon capacities with a high strength to weight ratio. Can be mounted horizontally or vertically. It has 16 inch access opening with 10 inch fill well. Baffles and sump are features of the new tank. For more details, circle (709) on the reply card.



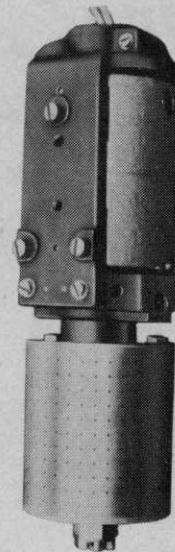
ELPHANT-VAC: Heath International, Inc., Richmond, Mich.

Mechanized mobile vacuum unit is capable of sucking up to eight 60 gallon bags of debris per hour. Capable of doing the work of five to eight men, depending on the density and type of debris, the unit will snatch up broken glass, bottles, cans, cups, paper, twigs, leaves, anything reasonably light and capable of fitting through Elphant-Vac's 8-inch diameter snout-like hose. Compact in design (only 9 feet long and weighing 920 pounds) this unit was designed to work in difficult, highly restricted debris ridden areas. Full production is expected to begin in January 1972. For more details, circle (710) on the reply card.



SELF-PROPELLED MOWER WITH FRONT WHEEL DRIVE: Buntun Co., Louisville, Ky.

Front wheel drive with extra large (10 x 2.75) wheels makes this 22 inch unit maneuverable and easy to handle in rough terrain. No engaging or disengaging clutches, for trimming around shrubs, trees and the hard to get areas. Special quick-type commercial height adjustment allows a quick change in cutting height. A deeper aluminum alloy frame permits even discharge of grass clippings into an optional grass catcher. Equipped with 4 hp engine, with 5 quart fuel tank and snorkel-type air cleaner mounted on handle. For more details, circle (711) on the reply card.



SPRAY SLEEVE: Beeco Products Co., Fort Washington, Pa.

Reduce application costs of wettable-powder and heavy-flowable fungicides with a new sleeve of perforated metal and the BEECO-MIST Model 275 spray head. It permits low-volume applications through controlled, uniform droplets of 80 to 100 microns. Fungicides are sprayed at the rate of 9 gallons per minute either from the ground or from an aircraft. For more details, circle (712) on the reply card.





Keith D. Law, Secretary, Minnesota Association of Nurserymen, represents that group and the Greater Minneapolis Chamber of Commerce in the presentation of ten 12-foot crabapple trees to the Kennedy Center for the Performing Arts, Washington, D.C. Seen with Law are (Left to Right) Mrs. Polk Guest, Chairman, Friends of the Kennedy Center; Mrs. Paul Hoyst, Trustee of the Kennedy Center; and Mrs. Lee Corcoran, President, Minnesota State Society.

bertson, president, Ohio Chapter, I.S.T.C. Speakers include Dr. Charles L. Wilson, director, Shade Tree and Ornamental Plants Laboratory, Delaware, Ohio, Dr. Winand K. Hock and Dr. Bruce R. Roberts, also from the Delaware, Ohio Laboratory.

The Tuesday session is devoted to landscape contractors. Speakers will deal with preparing and handling nursery stock to extend the planting season, the landscape architect and the contractor, residential landscape design for the 70's, and color and texture in the landscape.

Garden center operators will hear Dr. Vernon Vandermark, extension specialist in marketing, OSU, Wednesday on the topic, "Up-date Your Sales Techniques for Increased Sales and Profits." Extension plant pathologist, Dr. Robert Partyka, at OSU will also speak on "Can You Answer Your Customer's Plant Problems?"

Infrared Holds Promise For Turfgrass

Aerial infrared photography could become a quick and efficient tool in turfgrass management. That's what Robert L. Fleming of Environmental Surveys, Inc., a California based firm, told members of the 26th annual Turfgrass Conference at Texas A & M University in early December.

Fleming reported that surveys not only detect plant vitality but can show irrigation efficiency and loss of plant vigor before serious damage occurs.

Infrared filming saves time, he reported. It locates sub-surface rock conditions, moisture movement, sprinkling profiles and soil types. He cited a number of uses of infrared aerial photography. One was the problem of finding soil deep enough to reforest a mountain side. Infrared detected streaks of soil that would take the trees.

Possibly the most interesting and promising project underway, Fleming said, is a survey of 12,000 to 15,000 acres in California to determine the most likely place to tap tremendous steam resources 3,000 to 8,000 feet below the ground surface.

Such steam fields offer an almost unlimited source of power for electricity generation, he said.

About 300 persons in turf management from Texas and other states attended the two-day conference. Sponsors were the Texas Turfgrass Association and A & M University.

Ohio State Sponsors Short Course

The 43rd annual Ohio State University short course for arborists, turf management specialists, landscape contractors, and garden center operators and nurserymen will be held in Columbus, Ohio, Jan. 23-27. This course is held in conjunction with the annual meeting of the Ohio Nurserymen's Association, Inc., and the Ohio Chapter of the International Shade Tree Conference, Inc.

The program promises to bring new ideas, developments and techniques to the various industries. The opening day is devoted to arborists. An afternoon panel will discuss the topic, "Tree Moving — Equipment, Methods, Early Maintenance, and Practices I Have Found Successful." Panel Moderator is Dr. L. C. Chadwick, secretary, Ohio Chapter I.S.T.C.

Panel members are: H. M. Van Wormer, president, I.S.T.C.; F. L. Dinsmore Tree Service, St. Louis, Missouri; Edwin E. Irish, Chas. F. Irish Co., Inc., Warren, Michigan; James T. Cates, City Arborist, Richmond, Virginia; and, William Thornton, Thornton Environmental Industries, Inc., Cincinnati, Ohio.

The morning program the next day will be chaired by Henry Gil-

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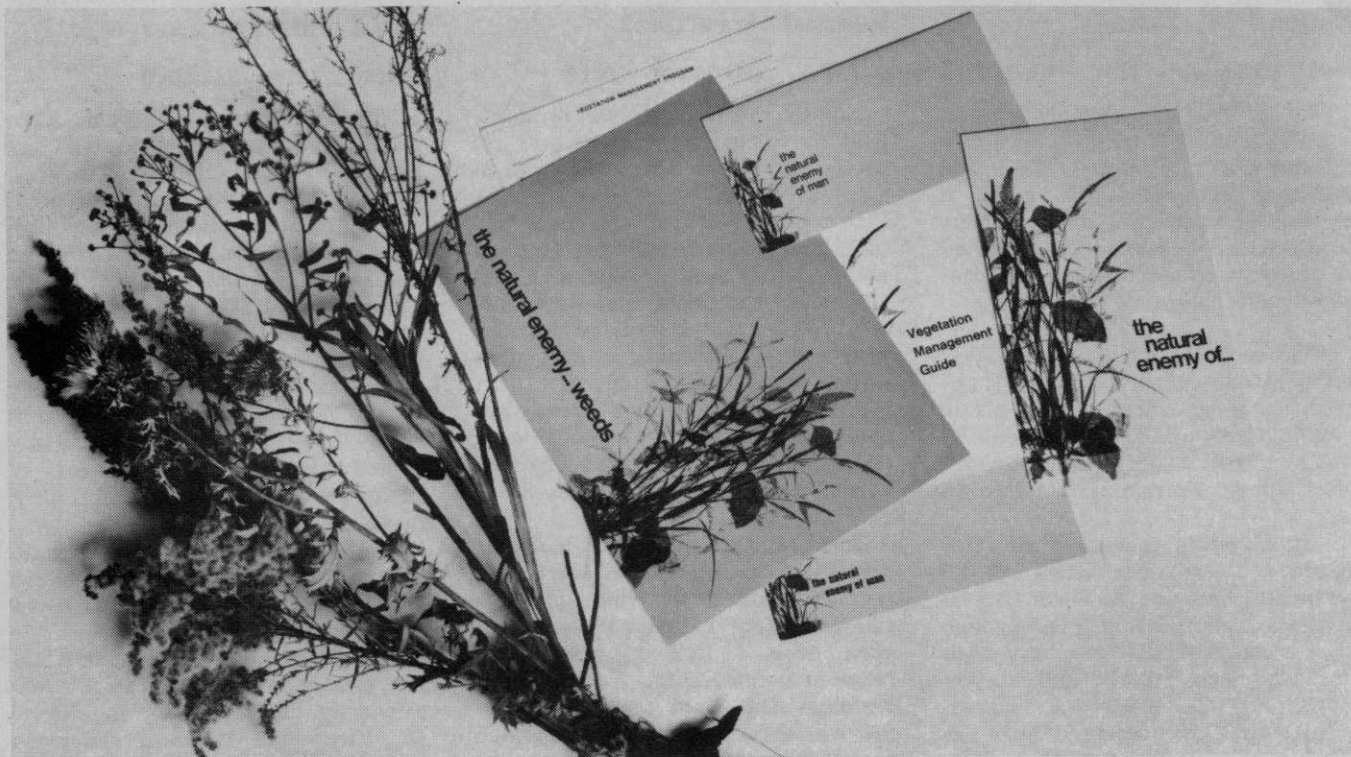
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That's why Geigy Agricultural Chemicals has produced a Vegetation Management Kit, designed especially to help make the job of weed control easier.

The kit is helpful in defining objectives, arriving at solutions and evaluating results and costs of weed control. There is no charge for the kit. It utilizes a large fold-out analysis spread sheet to be filled in by the weed control specialist. This chart helps in considering such planning factors as timing, safety and budget in the control of weeds.

Identifying the problem is the first step toward effective vegetation management. Describing the weedy area and determining major annual and other weeds to be controlled follows closely in any weed control program.

The analysis form helps in considering such essential safety fac-

tors as adjacent vegetation, trees, crops and lawns and considering potential hazards of runoff into adjacent waterways and channels.

Soil conditions, texture, organic matter and permeability are other factors to be dealt with. Equipment needed and available for vegetation control also must be determined.

After these and other determinations are made, the weed expert should be at the point of deciding on the best solution to the problem.

Mechanical control is broken into considerations as to what equipment to use, where it will be feasible to use it and when it should be used.

And chemical control is examined in detail. A choice must be made as to products to use: selective, non-selective or brush. Rate of applica-

tion must be determined. Deciding on the area to be covered leads to the final measurement of total investment.

For future use, the kit includes a special card for record keeping by area and a place for an evaluation of how well the objectives were realized, costs of both mechanical and chemical controls used, and, finally, a list of improvements that should be made in the next year's program. It also contains a booklet, "The Natural Enemy of Man, Weeds," that illustrates many hazards of weeds, including some seldom thought of.

The kit is available from Geigy distributors and salesmen or by writing CIBA-GEIGY Corporation, Ardsley, N.Y. 10502.

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Elanco Field Tests New Pre-Plant Herbicides

Elanco Products Company, Indianapolis, Ind., has field tested a new method for applying Treflan and Balan to cut operational costs. It consists of utilizing a dry bulk fertilizer which has been impregnated or coated with one of these two pre-plant herbicides.

Field tests conducted by fertilizer companies in cooperation with Elanco utilizing these fertilizer-herbicide combinations have demonstrated weed control results equal to the application of Treflan and Balan in water.

Any blending system which will assure uniform distribution of the herbicides onto the fertilizer can be utilized. This coating process has been accomplished successfully with closed drums, mixers and ribbon blenders.

All label recommendations for Treflan and Balan regarding rates of application per acre, incorporation, approved crops, other label directions and cautions apply and must be followed. In addition, bulk fertilizers coated with Treflan or Balan must be applied immediately.

The recommended rates of Treflan or Balan per acre must be applied on the fertilizer mixture, which in turn will be applied at a rate between a minimum of 250 pounds per acre and a maximum of 450 pounds per acre.

Fertilizer blends containing limestone or urea should not be used. An approved list of dry fertilizer ingredients is available from bulk fertilizer suppliers.

New Brochure

A new brochure, "Planning A Golf Course?" has just been released by the Golf Course Builders of America.

The leaflet, designed especially for persons or organizations contemplating construction of a golf course, identifies the national sources for information about the golf industry and course construction. It also highlights prospective golf course owners should consider before starting construction.

The publication is available at no cost by writing Golf Course Builders of America, 632 Shoreham Building, Washington, D.C. 20005.

**WEEDS TREES and TURF
for March
Weed Control Issue**

Helicopters Fertilize 60,000 Acres of Trees

Among the most extensive short-term fertilizer applications was recently completed on 60,000 acres of trees in Oregon.

Evergreen Helicopters, Inc., applied more than 10,000 tons of granular fertilizer near Eugene, and near Longview, Centralia, and Raymond, Wash. The job was done for the Weyerhaeuser Company as part of its timber management program.

About 90 percent of the trees were Douglas fir and the balance were nelmlock, all from 25 to 80 years of age.

Carl Milko operations manager said the first 50,000 acres were covered in about 30 working days this fall using four helicopters — one in each area—and Evergreen's own patented underslung distribution systems. The final portion of the job was done by a single helicopter during November.

Flying hours reached a maximum of seven per day, depending on factors such as winds, fog and rain. Rate of fertilization, with all four copters in operation, was as high as 35 tons per hour. Much of the area covered in the operation is terrain that would greatly reduce the mobility of ground crews.

Evergreen's dispersal units carry about 3,200 pounds of fertilizer per trip and have a gross weight of approximately 4,000 pounds, easily accommodated by the medium-size turbine 205A's. Each system is driven by a Volkswagen engine and is electrically controlled from the helicopter cockpit.

Weyerhaeuser has three helicopters of its own, but the company periodically contracts with commercial operators for sizeable numbers of additional units for its continuing research programs to improve survivability and yield of timberlands.

New Owner For Jari Sickle Mower Line

The Year-A-Round Cab Corporation, Mankato, Minn., has announced that, as new owner, parts as well as new equipment will be ready to Jari sickle mower users.

The company recently purchased the line and will manufacture two models with sickle sizes ranging from 16 to 60 inches.

1972 Turf and Landscape Horticulture Institute

The University of California Agricultural Extension Service and the Southern California Turfgrass Council, in cooperation with other environmental landscape organizations, will present the 1972 Turf and Landscape Horticulture Institute on March 21 and 22, 1972. It will be at the University of California Irvine Campus.

The two-day Institute (formerly known as the May Turfgrass Institute) is an educational event designed for landscape architects of turfgrass and other ornamental plant material.

The Institute will feature well-known speakers who have made a valuable contribution to the environmental landscape industry.

Further details regarding this major educational event can be obtained by directing your inquiry to Dr. Victor A. Gibeault, Extension Turf and Landscape Horticulture Specialist, 1145 Batchelor Hall, University of California, Riverside, Calif. 92502.

Republic Rubber Drops Some Product Lines

The Republic Rubber Division of Aeroquip Corporation at Youngstown, Ohio, has announced that it will discontinue a number of product lines.

Lloyd C. Preston, vice president and general manager of the division, stated that present economic conditions have aggravated the competitive situation on certain marginal lines. The products to be discontinued include conveyor and transmission belting, sheet packing, and some types of hose. Manufacture of these products will be phased out during the first quarter of 1972, Preston said.

He explained that high costs and the inability to obtain price relief because of the competitive situation led to the decision to drop the product lines. Age and condition of the production facilities were also contributing factors.

Discontinuing these marginal lines, Preston added, will permit the division to devote more resources and management direction to the major product lines. Republic will continue to manufacture horizontal braided and loomed hoses, molded rubber goods, and lathe cut rubber products.

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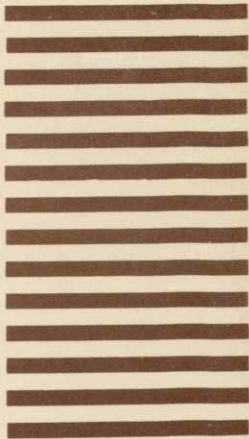
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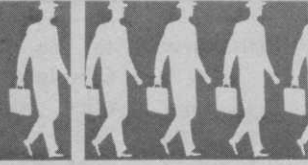
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industry people on the move



LOREN E. HILL, named general manager of Davis Manufacturing, Division of J. I. Case Company. He replaces Charles Davis who resigned December 31.

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RUDOLF GRUN, elected to board of directors, Amchem Products, Inc. Announcement made by Eugene A. Snyder, Amchem President.

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JIM BATTEN, promoted to branch manager, Thompson-Hayward, Newark Chemical Distribution Center. He will head up marketing efforts in Delmarva and surrounding areas.

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KNUD H. HOFFMEYER, to chief engineer, Turf and Commercial Products, Jacobsen Manufacturing Company, Racine. Hoffmeyer succeeds Donald Haffner who was promoted to manager, Product Engineering.

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JOHN J. MADDEN, named national sales manager, Melnor Industries, a division of Beatrice Foods Company.

* * *

JOHN C. CARRINGTON, Maurice F. Dufour and Forbes K. Wilson, all elected senior vice presidents of Freeport Minerals Company. Each of the new officers serves as president of a Freeport division or subsidiary.

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HARVEY L. SLADE, joined Bolens Division of FMC Corporation in Port Washington, Wis. as assistant to division manager, David Hill.

DR. JOHN R. HALL, III is the new extension turf-grass management specialist at the University of Maryland. His father is a retired golf course superintendent at the Pekin, Ill. country club. His grandfather was a former president of the Professional Golfers Association in Ohio.

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ROB R. SMITH, appointed national sales distributor for Robco, Inc., Burlingame, Calif. Smith is owner of Equipment Sales and Service Company, San Jose.

* * *

JOSEPH P. BARKER, appointed plant manager of Scott Aviation's Charlottesville, Va., plant. Formerly he was marketing manager for the Davis Instrument line at Scott Aviation.

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LUTHER L. SCHOEN, joins sales team of NOR-AM Products, Inc. for New York and Pennsylvania territory; from Bechtel Corporation, Plymouth, Mass.

* * *

C. LESLIE McCOMBS, to head of Horticulture Department at Virginia Tech, Blacksburg, Va., from North Carolina State University.

* * *

ROBERT G. McMASTER, named marketing manager, Concrete Machinery Division, J. I. Case Co; he has been with Case since 1957.

* * *

JAMES L. JOPLIN, to sales engineer, Commercial and Turf Products, for Jacobsen; from Velsicol Chemical Corp. New territory is Arkansas, Kansas, Oklahoma, Missouri, and Texas.

* * *

WILLIAM COPENHAVER, named executive vice-president of Columbia Nitrogen Corporation, Augusta, Ga.; from position of president, Canadian Celanese Corp.

Stop Erosion with Ground Cover Product

A new soil erosion control ground cover product that prevents erosion and speeds seed germination and grass growth on landscaping projects has been developed by Swift Textiles, Inc.

Called Swif-Gro, the product does a good job when stapled down over seeded areas, and also works well over sprigs. The material enables a contractor to get grass quickly without soil erosion.

Swif-Gro is an all cotton woven mesh fabric laminated to cellulose tissue mulch. The material is packed in 500 yard 170 pound rolls 75" wide which makes it easy to handle. It lets needed moisture in while the excess water runs off thereby preventing erosion. Once grass starts coming up the tissue disintegrates.

It is not necessary to remove the material.

Check Electric Motors Regularly

Electric motor maintenance is important in assuring long service.

Many motors, such as those on fans and pumps of heating and ventilating systems, have logged numerous hours of operation with dirty, wet and cold surroundings. It'll pay you to inspect these motors and clean the moisture, grease, and other dirt from them, advises William R. Schnug, extension agricultural engineer at The Ohio State University.

Cleaning procedures vary. A totally enclosed motor needs only the outside frame wiped clean. Open-type motors require both inside and outside cleaning. A strong vacuum cleaner will usually be adequate in

cleaning the interior of the motor. Compressed air can also be used to blow dirt from the motor windings. Avoid excessive air blast that may embed dirt and metal particles, warns Schnug.

If a motor is exceptionally dirty, it must be dismantled, cleaned and re-assembled.

Large motors may have grease-lubricated bearings. Those with a drain plug should be greased until a small amount of fresh grease emerges from the drain. If there is no drain, a few pumps of a good quality grease every six months is usually enough lubrication.

Avoid over-lubrication of bronze sleeve bearings. A few drops of #10 oil every 5-6 months is sufficient.

Supply conductor breakdowns result in electrical failures. Schnug advises checking for cracked cords, loose or worn box connectors and loose connections at motor terminals.

YOUR LAWN: HOW TO MAKE IT AND KEEP IT by R. Milton Carleton. 127 pages, illustrated. Retail price: \$7.95.

About the Author: R. Milton Carleton is well-known as an author of books on gardening and as an editor of the periodical, *Chicago Today*. He has also pioneered in studies of new turf varieties and preemergence crabgrass controls. He is currently investigating the effects of artifi-

cial light and soil substitutes on plant growth.

About the Book: Your lawn consists of 14 chapters. Early in the book he answers the question, what is a lawn good for, by detailing the esthetic and environmental values. Chapter headings on drainage and grade and soil follow next. The next section deals with arriving at and maintaining a good nutritional balance. This is followed by a chap-

ter on the importance of pH. Chapters 6-10 cover grass varieties, starting and maintaining your lawn, places where grass does not thrive, renovation, and rough lawns, respectively. The balance of the book involves discussions on pests—on and in the turf, weed control, lawn diseases and mechanical equipment. The book is well-written and easy to read. Maps and line drawings are interspersed throughout the book.

WEED CONTROL (from page 16)

decomposition by ultraviolet light has been suggested as an additional factor.

RESIDUES: The actual amount of herbicides in the environment has been studied in numerous monitoring surveys throughout the United States. We know, of course, that treated soils and waters contain herbicides for some period after treatment; otherwise we would not have weed control. Our concern is with the possibility of appreciable residues for long periods after treatment or the occurrence of herbicide residues in untreated or non-target sites.

Since residues are reported in terms of concentration — parts per million (ppm), parts per billion (ppb) and even parts per trillion (ppt)—it is important to recognize what these figures actually mean. The amount of soil covering an acre, one foot deep (usually called an acre foot of soil) weighs about 3½ million pounds. Thus if we apply 3½ lbs. per acre of an herbicide and mix it throughout the upper foot of soil, the concentration will be 1 ppm. If we mix it only in the top 6 inches of soil the concentration will be higher — 2 ppm. It is the same amount of herbicide but mixed in less soil.

If we are concerned with water we should remember that water weighs 62.4 pounds per cubic foot and 8.33 pounds per gallon. Thus an acre foot of water (enough to cover an acre one foot deep) weighs about 2.7 million pounds and an herbicide application of 2.7 lbs. to an acre foot of water gives a concentration of 1 ppm. In terms of gallons, 8.33 pounds of herbicide are required to give a concentration of 1 ppm in a million gallons of water.

Some concept of the minuteness of 1 ppb can be obtained from a consideration of the population of

the whole earth which is between 3 and 4 billion people. Thus 3 or 4 people represent 1 ppb of all the people on the earth today. Residue concentrations need interpretation in terms of amounts as well as concentrations!

Residues in soils have been monitored for some time. A detailed study in six areas over several years revealed only minor amounts of phenoxy herbicides. Out of 264 samples only 4 contained 2,4-D with an average concentration of 0.032 ppm. None contained 2,4,5-T. In none of these surveys has there been evidence of excessive accumulation of any herbicide in the soil environment.

Residues in water have likewise shown no evidence of accumulation. A monthly survey of 11 major streams in the Western U.S. in 1967 revealed no residues of 2,4-D, 2,4,5-T or silvex. A U.S. Geological Survey of 20 sites on Western streams using refined analytical methods showed only fractional parts per billion of 2,4-D, 2,4,5-T and silvex in a limited number of the several hundred samples analyzed. Again, there is no evidence of accumulation of phenoxy herbicides in any of the studies.

Residue data in plants are required for registration and breakdown curves and total amounts of residues are the bases for the tolerances set. There are pages of such data in every petition for a tolerance. Spot checks by regulatory agencies rarely reveal residues in crop plants in excess of established tolerance when the use pattern has followed label restrictions. There is no evidence of excessive herbicide residues in any of our food stuffs.

Residues in animal products have also been monitored. In 1969, the Consumer and Marketing Service, USDA, analyzed 240 samples of red

meat fatty tissue from 44 locations across the U.S. for 2,4-D. More than 96% showed no residue, with only 3 samples showing more than 0.10 ppm and none as much as 1 ppm. There is also no evidence of accumulation in milk even when 2,4-D was fed directly to lactating cows.

Residues in the air have had only limited study, but as indicated earlier, drift or volatility may result in air contamination for brief periods. Usually the effects are evidenced on neighboring vegetation and rapidly diminish with distance.

EFFECTS ON ORGANISMS: An extensive bibliography on toxic effects of herbicides to a wide variety of organisms was published by the National Agricultural Library in 1968 and many publications cover effects of specific herbicides on specific organisms. Even extensive use of herbicides has produced changes in only limited areas and I know of no plant species that has been eliminated through the use of herbicides.

The majority of current herbicides must be fed in large quantity to produce any toxic symptoms. Extensive feeding tests are run on all herbicides prior to registration and the hazards, if any, are known. At normal rates of application our current widely used herbicides appear to have no direct effects on wildlife or farm animals. Residues have not appeared in milk or eggs. There is no evidence of wildlife destruction although changes in cover and possibly food plants on limited areas have caused population movements to other untreated areas.

For man, the only toxic effects have been from the direct ingestion of herbicides for intended suicide or accidental ingestion by children as the result of adult carelessness.

There is no evidence that the use of herbicides today contributes to deterioration of our environment.