

"Instant Shade!" Now...Plant Large Trees in Minutes!

Vermeer TS-66T Tree Spade Does It . . . Automatically!

"The Diggin' Dutchman" introduces "Instant Shade" . . . with an automatic tree mover that digs, balls, transports and plants large diameter trees in minutes. The Vermeer TS-66T is fast . . . it's economical . . . it's automatic. One man and one TS-66T can handle the entire job in minutes. That's why we call it "Instant Shade," and that's why Vermeer Tree Spades are used by landscapers, nurseries, cities, rental yards and tree service firms everywhere. Write "The Diggin' Dutchman" for information and complete literature.



Another Tree Spade From . . .

THE DIGGIN' DUTCHMAN

VERMEER TREE SPADE DIVISION
7210 W. Washington • Pella, Iowa 50219



Truck-mounted TS-66T Tree Spade transplants big 6" diameter tree with hydraulically-operated, high tensile steel spades. Digs 66" diameter tree ball, down to 60" deep to prevent root damage.

For More Details Circle (128) on Reply Card

Meeting Site Ballot Sent To ASPA Members

The American Sod Producers Association has queried its members for a location of a winter meeting.

According to Dr. Henry W. Indyk, three preferred locations have been selected, San Diego, Honolulu and Phoenix. In a letter to Association members, board member Tobias Grether has stated the meeting date to be mid-February.

We are attempting to put together a program around financial aspects of the chart of accounts produced for us by Kallick in Chicago, said Grether. The program would be built around this financial statement to analyze the profitability of your operation and the indication it will give you of what to change and how to gain better profits through its use.

The idea of the winter meeting would be to charter an aircraft from either Chicago or New York and fly ASPA members to the meeting site. In all, seven potential sites may be voted upon.

Members are asked to indicate their preference of area and forward this information to Dr. Henry W. Indyk at their earliest convenience.

Assoc. Landscape Contractors Opens Booth Space For Show

The Associated Landscape Contractors of America (ALCA) is now reserving booth space on a first come first served basis for its 11th Annual Meeting and Exhibit to be

held January 21-26, 1973 at the Doral Country Club and Hotel, Miami, Florida.

This show offers exhibitors a one-year opportunity to display equipment, supplies, products, and services to a truly decision-making audience of landscape contractors.

A record attendance is expected.

There will be no competing functions, either business or social, held during the exhibit.

For information concerning the Meeting and Exhibit contact Tom Stewart, ALCA, 1750 Old Meadow Road, McLean, Va. 22101, (703) 893-5440.

Maryland Horticulturist Receives National Recognition

Dr. Francis C. Stark, Jr., horticulture department chairman in the College of Agriculture at College Park, has become the University of Maryland's sixth faculty member in five years to be elected as a Fellow of the American Society for Horticultural Science.

Dr. Stark was among 15 distinguished members of the Society in the eighth annual class of Fellows honored at the organization's awards banquet highlighting the sixty-ninth annual ASHS meeting.

The society's signal honor is accorded to those members who have made outstanding contributions to horticultural science—the profession or the industry—in the areas of research, teaching, Extension, or administration on a state, national or international level.

A native Oklahoma, Dr. Stark has been an ASHS member since obtaining his B.S. degree from Oklahoma A & M in 1940. He obtained his M.S. at Oklahoma A & M in 1941 and his Ph. D. from the University of Maryland in 1948.

For fastest-starting turf



PARK Variety Kentucky Bluegrass

The 1972 crop grown by Northern Minnesota Bluegrass Growers Association is the best yet. Production is up, quality excellent.

We advise you to order your Park seed early, as supplies of this popular variety are usually sold out before the end of the season. All seed is Minnesota-certified.

Available exclusively from

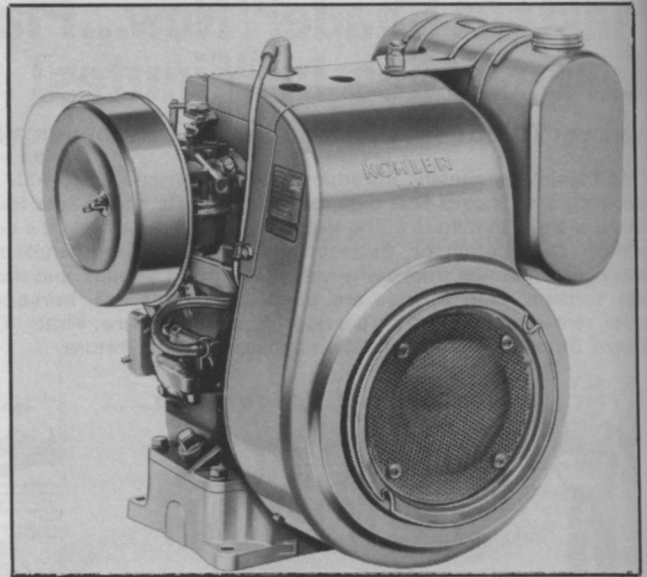
TWIN CITY SEED CO.

500 30th Ave. N.E., Minneapolis, Minn. 55418
Phone (612) 789-8821



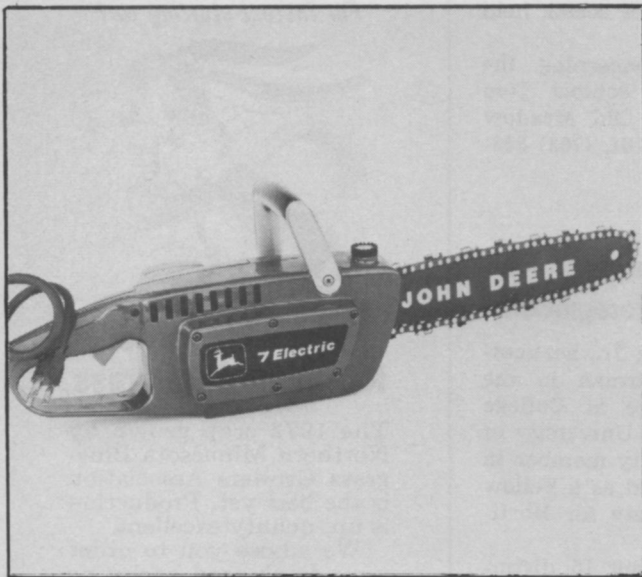
QUICK-CHANGE LOADER: International Harvester Company, Chicago, Ill.

Need a loader for a variety of jobs? Here's one where versatility was stamped across the design specifications. A quick-change plate attaches to the loader arms and cylinders of model 3200A. The operator then drives up to the attachment, engages the pins into the holes and hoists. The weight of the attachment automatically moves the bottom rings into position. No mechanical parts to malfunction or rust shut. Attachments include a variety of utility and dirt buckets, a blade, an adjustable fork lift, a lift boom, snow bucket, a bracket to mount a snow blower and a new 6-tine manure fork. For more details, circle (701) on the reply card.



COMPACT 16 HP ENGINE: Kohler Company, Kohler, Wisc.

You asked for it and here it is. A new 16-hp, air-cooled, cast iron engine that is within ¼-inch of earlier Kohler compacts and weighs but 4 pounds more. The new model K341 has low sound and vibration levels. An automotive-type muffling and inherent sound dampening features of cast iron make for quiet operation. Other features include full chrome rings for longer ring and engine life, new cylinder head for improved combustion, larger capacity air cleaner, re-designed porting and valving that contributes to optimum power output and automatic compression release to assure positive starting. For more details, circle (702) on the reply card.



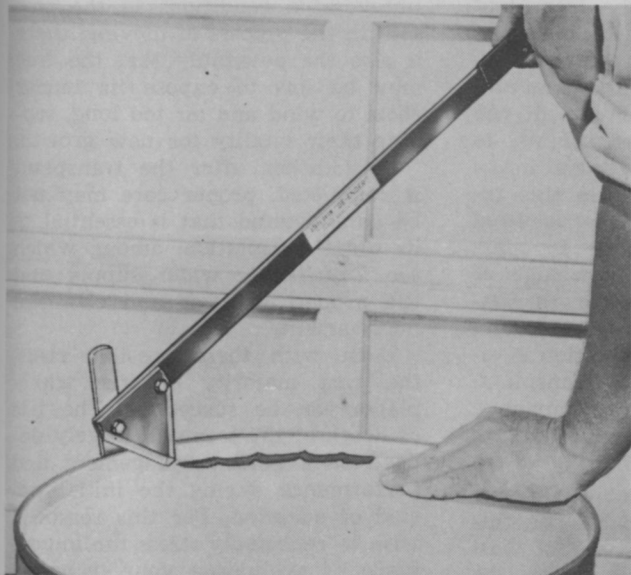
ELECTRIC CHAIN SAW: John Deere & Company, Moline, Ill.

"Chained Lightning" is how the manufacturer describes this new model 7 electric saw. The compact unit has a 12-inch guidebar with chrome plated cutting edges. Saw construction uses ball bearings throughout for smoother, longer-lasting operation. All wire connections are welded, instead of soldered, to withstand high heat. If noise and pollution requirements are a factor in your operation, this saw is the answer. For more details, circle (703) on the reply card.



M-418 TRENCHER: Vermeer Manufacturing Co., Pella, Iowa

This trencher is equipped with an 18 hp, air-cooled engine, power steering, 4-wheel drive and a choice of flotation or traction tread tires. It will dig up to 12 inches wide, down to 60 inches deep, with four chain speeds forward, plus reverse. Dual augers may be raised or lowered to handle spoil close to the trencher or sweep it to the sides. Hydraulically-operated five foot backfill blade may be raised, lowered, or angles 30 degrees left or right. It features a replaceable alloy steel grader edge. Other attachments include a rear-mounted vibratory plow and an easy-to-mount auger boring tool that attaches to the backfill blade. For more details, circle (704) on the reply card.



DE-ENDER: C. & I. Manufacturing, Inc., Warsaw, Indiana

Remove drum heads the easy way with this heavy-duty, metal drum cutting tool. It eliminates unsafe uses of chisels or torches. Sturdy construction and low cost blade replacement provide a tool that cuts any size drum, and gauge of metal, to convert drums into reusable containers. For more details, circle (705) on the reply card.



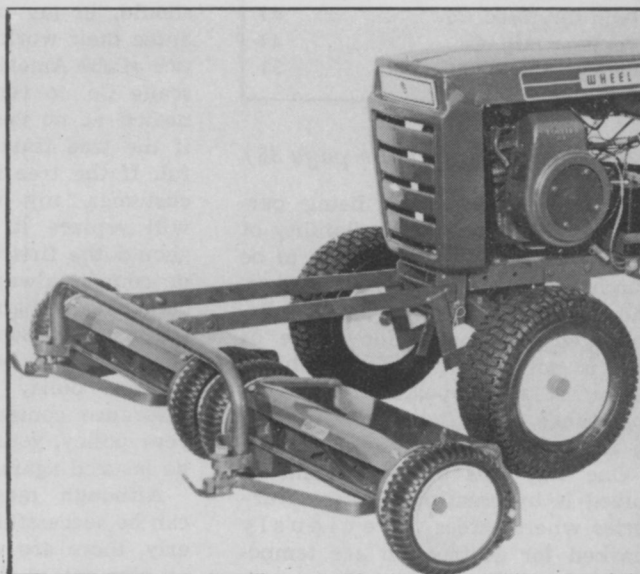
ROTARY VACUUM SHREDDER/BAGGER:
MTD Products, Inc., Cleveland, Ohio

SHRED-IT is a powerful 5 hp shredder/bagger that consumes all organic materials including branches up to 2 inches in diameter. It's designed for the organic gardener and the ecology buff who has a growing interest in compost. Hopper size is 19 1/4 inches square. It has a drop chute for rake feeding, a special 2 1/2-inch by 5-inch chipping chute, nylon mesh bag with patented slip-proof slide locks to accommodate a disposable plastic liner, and a 3-stage cutting action blade and hammer knives. It's portable. Moves around like a wheelbarrow on rubber tires and steel wheels. For more details, circle (706) on the reply card.



TURF CARE SPREADER: Avco Ezee Flow, Coldwater, Ohio

Here's a spreader designed for smaller areas of turf care—industry, estates, etc. It features a 54-inch spreading width and has a hopper capacity of 7.7 cubic feet or 500 pounds. Model 105 can be pulled by conventional tractors or the subcompacts with 10 hp or more. Superintendents of smaller courses will like the patented cam agitators which force material through the ports in the hopper bottom to assure accurate metering. An exclusive feed rate control permits exact control of spread rate. The spreader is ideal for spreading ice control materials in the winter and dust control chemicals at other times. For more details, circle (707) on the reply card.



FRONT-MOUNTED MOWER: Roxy-Bonner, Inc., Huntingdon Valley, Pa.

Model UM21-3W easily mounts on the front of small utility and garden tractors. Mowers up front help eliminate wheel tracks. Unit is highly maneuverable, swinging in and out around shrubbery. Visibility is excellent. Mower cuts a 56-inch swath. It is made of heavy cast iron construction with steel rollers. Available also is a unit for drawbar pulling in the rear which cuts a 90-inch swath. For more details, circle (708) on the reply card.



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INSTANT SHADE (from page 38)

more transplants from being performed is the lack of availability of mature trees. If the trees are to be purchased from an outside source, the potential transplant may be discouraged if a particular specie or size is not found. The availability factor is an important one, and sometimes necessitates compromises in the selection of specie and size.

One way this problem could be solved is by creating *Holding Nurseries* where trees previously marked for destruction are temporarily transplanted for future permanent transplants. A minimum amount of maintenance is required for such a *Holding Nursery* and thus the endeavor becomes economically practical.

Of course, some care must be taken in selecting a site for the *Holding Nursery* . Availability of water and a good access road are just two points that contribute to the economic practicality of such a venture.

To find a reliable source that can

successfully perform the transplant can be another problem. There just aren't that many companies who specialize in transplanting mature trees. That's why we invite anyone interested in tree transplants to write or call us for additional information. A service such as this requires sophisticated, specialized equipment and the skills to operate them. Extensive knowledge of trees, including their growth patterns, vulnerability to diseases and adaptability to transplantation is essential for a successful transplant. This knowledge must accompany a company's service if the mature transplant is to succeed.

How can you determine if a particular source is capable in this field? Ask for references of past jobs that might be similar to the one you're considering. Call the greenskeeper at a local country club. Ask a landscape designer. Discuss requirements with as many sources as possible, then compare recommendations and cost estimates. And don't be afraid to use the phone—call out-of-state sources for further comparisons. **Checking out a source costs very little. Poor judgement in transplanting could cost much more, so be thorough!**

If a company is reliable and has confidence in themselves they should, in my opinion, fully guarantee their work. It's been the practice of the American Tree and Landscape Co. to replace any tree furnished at no cost to the customer, if the tree transplant is unsuccessful. If the tree is furnished by the customer, my company generally will replace it at a reduced cost should the first tree die. There are, of course, always extenuating circumstances—lightning or hurricanes for instance. Some of these unusual conditions can be covered by an insurance policy with your present insurance company. In fact, check your policy, your trees may already be insured against such misfortunes.

Although most tree transplants can be successful if performed properly, there are variables that bring an element of risk into the picture. It is always critical that the variables be recognized and controlled. One must realize that in transplanting a tree he is putting it through a traumatic experience. From a heavily shaded area, the tree might be moved to an open, sunny and windy area. A tree grown in a protected area is not as hardy as one that has been fully exposed to weather elements. Thus, the bark may split soon after the transplant. The root system may likewise find

unfavorable conditions in the new soil. In the process of moving, there is also the possibility that the tree may be left to expose its tender roots to wind and air too long, sapping their vitality for new growth.

In addition, after the transplant is completed, proper care may not be administered that is essential to its initial adaptation, among which are a sufficient water supply and the proper fertilizer and chemical nourishment.

Even with these possible risks, the vast majority of tree transplants can be successful. The life or death of the tree will largely depend on a person's judgement and performance during the initial period of adaption. For this reason I wish to repeatedly stress the importance of evaluating your technical source critically.

Sophisticated Irrigation System Designed Around Scarce Water

Perhaps the most sophisticated irrigation system ever designed for a golf course is being installed at the Castle Harbor Golf Course in Bermuda by Larchmont Engineering and Irrigation, Inc. of Lexington, Mass.

Due to the scarcity of water on the Island, Joseph C. Tropeano of Larchmont Engineering spent two years studying the response of the turf to various applications of water and rainfall. He observed that turfgrass responded very quickly to a very small amount of precipitation, especially at night.

A special system was designed which gave the greens first priority followed by the tees and then the fairways.

A unique timing system enables Castle Harbor to select landing areas to make the best possible use of water where it is most needed.

And in order to accomplish this remarkable feat, a Johns-Manville binar system was selected because this system had the greatest flexibility to meet with the requirements of Larchmont Engineering.

Irrigation is done at night when the soil cools down to eliminate surface evaporation and evaporation of the water while in its trajectory stream.

Night watering enables the moisture to soak into the root zone before the wind and sun has an opportunity to evaporate it.

Larchmont Engineering and Irrigation, Inc. feels that this concept in water conservation can be duplicated all over the world.

insect report



TURF INSECTS

BLUE GRASS BILLBUG

(*Sphenophorus parvulus*)

IDAHO: Infested lawns in Twin Falls, Twin Falls County, and in Payette, Payette County. Infestations apparently spreading.

CHINCH BUG

(*Blissus leucopterus leucopterus*)

NEW HAMPSHIRE: Completely destroyed some lawns in Durham area, Strafford County.

SOD WEBWORM

(*Pediasis mutabilis*)

COLORADO: Adults ranged 5-10 per square yard on grasses in Fort Collins area, Larimer County.

INSECTS OF ORNAMENTALS

EUROPEAN EARWIG

(*Forficula auricularia*)

MICHIGAN: Several adults collected near residence in Benzonia, Beulah County. This is a new county record.

SPIDER MITE

(*Eurytetranychus buxi*)

PENNSYLVANIA: Adults collected on *Burus* sp. in Harrisburg, Dauphin County, July 26. This is a new state record.

TREE INSECTS

BLACK TURPENTINE BEETLE

(*Dendroctonus terebrans*)

ALABAMA: Infested numerous pine trees on lawns and in timberland following damage by lightning, construction equipment, and other damage in Mobile and Baldwin Counties.

LARGER ELM LEAF BEETLE

(*Monocesta coryli*)

GEORGIA: New infestations found in Morgan, Monroe, and Butts Counties. Many elms infested along 25-mile front in 10 lower Piedmont counties from Spalding County to Lincoln County; defoliation usually 100 percent. ALABAMA: Many large elms along 4 creeks in Elmore County defoliated.

SMALLER EUROPEAN ELM BARK BEETLE

(*Scolytus multistriatus*)

CALIFORNIA: Infested Chinese elm trees at rate of 96 per limb at Poway, San Diego County.

PINE TUSSOCK MOTH

(*Dasychira plagiata*)

MINNESOTA: Mostly pupae in northern Pine County; adults emerging. High percentage of pupae parasitized or diseased. Very few egg masses found as of August 2.

SPRAY SERVICE FOR SALE



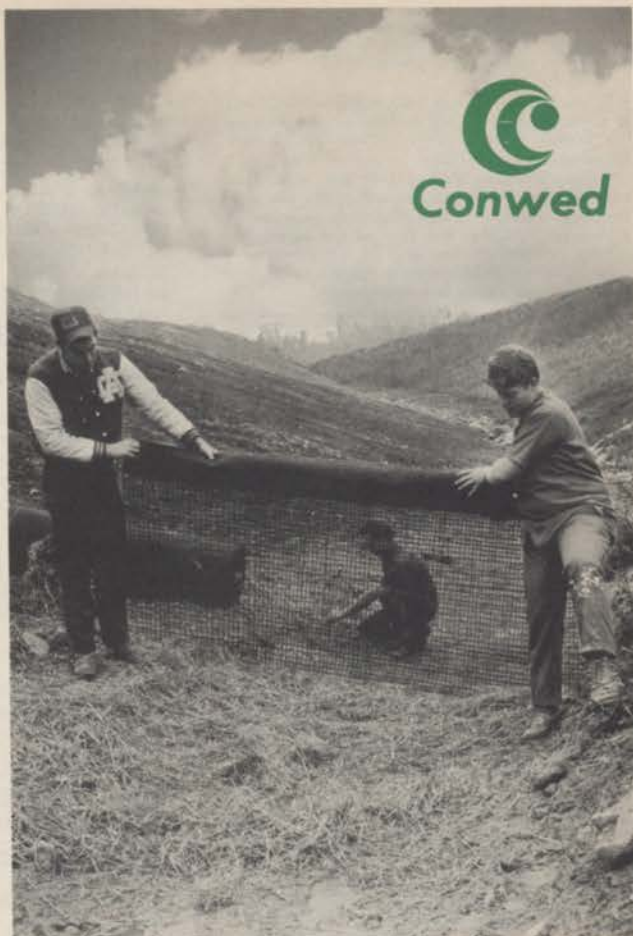
- 1500 gallon stainless steel tank divided into three 500 gallon tanks.
- Three reels, hoses and guns with electric forward and reverse reel.
- Economical four cylinder diesel to run 80 gallon per minute pump.
- Double plumbed for separate pump.

Four times per year contracted customer route, located in west Portland, Oregon. Will continue in pruning and shaping business, but will work closely with the spraying operation for buyer. Will consider working partner. Asking \$55,000; Terms.

Write or call: **Bill Bailey**

P.O. Box 25273, Portland, Oregon 97225

(503) 292-6363



Reduces erosion quickly and cleanly

Conwed® Erosion Control Netting

Write for the facts. Learn how this strong, light-weight plastic netting applied over loose mulch or sod reduces erosion in the toughest spots—ditches, cuts and steep hills.

Easy application—2500' rolls available in 7½', 12' and 15' widths. One large roll covers up to an acre. Conwed Erosion Control Netting slowly disintegrates on the ground.

Your request will also bring you information about Conwed's complete line of other turf establishment products. Write now to: Conwed Corporation, Dept. WTT-102, 332 Minnesota Street, St. Paul, Minnesota 55101.



Conwed
CORPORATION

For More Details Circle (116) on Reply Card

— classifieds —

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

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

SEEDS

SOD QUALITY MERION SEED for discriminating growers. Also Fyking, Delta, Park, Newport, Nugget and Pennstar bluegrasses as well as fine fescues. We will custom mix to your specifications. Michigan State Seed Company, Grand Ledge, Michigan 48837. Phone 517 627-2164.

MISCELLANEOUS

TREE APPRAISALS, SURVEYS, loss evaluations and expert consultation services. For names of members of the American Society of Consulting Arborists, Inc., throughout the country, contact: Executive Director ASCA, 12 Lakeview Ave., Milltown, New Jersey 08850.

LANDSCAPE DESIGN KIT 37 rubber symbol stamps and ink pad, postpaid \$25.00 C.O.D. \$26.00 plus postage. Order direct or brochure sent. California add tax. T-Gordon's, Box 741T, Reseda, Calif. 91335.

USED EQUIPMENT

FULL LINE OF USED TREE equipment for sale. We accept trade-ins and buy used tree equipment. New service available for northern Ohio. We now rent skyworkers, tree spades, brush grinders, 84' National crane, stump grinders and wood splitters. Edwards Tree Service, 3190 Cooper Foster Park Road, Vermilion, Ohio 44089. Phone: 216 967-6750 or 933-6750.

FOR SALE

DOUBLE EDGE sod cutter blades. Will fit any Ryan sod cutter. Works like double edge razor blade. Cuts much more sod per blade. Made to bolt on both ways. \$24.00 plus postage. New automatic sod loaders for direct loading to pallets, trucks or trailers. No workers needed on ground. Both products developed and designed by Hadfield. Write or call Glen Hadfield, 4643 Sherwood, Oxford, Michigan 48051. Phone 313 628-2000.

CHAIN SAW CHAIN, bars, sprockets, sharpening equipment, saw parts and accessories. Save to 40%. Professional quality, fully guaranteed. World's largest mail order supplier of this equipment. Free catalog. Write Zip-Penn, Box 43073-A68, Middletown, Ky. 40243.

THE GOLD ONES from D. J. Andrews, Inc., Stump cutter teeth, pockets, and bolts. Top quality and best price in the U.S.A. D. J. An-

draws, Inc., 17 Silver St., Rochester, N.Y. 14611. Call 716 235-1230 or 716 436-1515.

HELP WANTED

DISTRIBUTORS for D. J. Andrews, Inc. stump cutter teeth, pockets and bolts. Best wholesale and retail price in U.S.A. Add to this exclusive area. local advertising at our expense, etc., and you have our story. D. J. Andrews, Inc., 17 Silver St., Rochester, N.Y. 14611. Call 716 235-1230, or 716 436-1515.

USED EQUIPMENT

WANTED: Spray pump and truck to rent two weeks before Memorial Day, 1973, with at least 50 GPM and 600 gallon capacity, along with operator. Will pay \$1,000 to \$1,500 plus the labor costs. Contact Tamke Tree Experts, Inc., Box 571, Bernardsville, N.J. 07924. Phone: 201 766-1397.

TM-700 TREE MOVER, like new condition; manuals and extra parts. Parsons Tree Service, 5628 Maxine Court, Alexandria, Virginia 22310. Phone 703 971-3998.

GIGANTIC

Equipment & Chemical

DIRECTORY

December WTT

This harvester works anywhere

Unlike other harvesters, the Nunes Mechanical Sod Harvester is guaranteed to work wherever cultivated sod is grown.

Hydraulic controls permit quick and easy adjustment to different field terrain, soil and sod conditions **while in operation.**

With the Nunes Harvester, you can cut, lift, roll (or slab) and palletize more than 1000 sq. yards of sod per hour.

Roll or slab units are interchangeable and the machinery handles rolls or slabs 12 to 20 inches wide (24-inch width machines on special order.)

Special discounts are available on signed orders, with deposits, received before December 15.

Also available are vacuum sweepers designed especially for sod.

Write for detailed brochures and additional information.

Nunes Manufacturing Company
2006 Loquat Ave., Patterson, Calif. 95363
Phone (209) 892-8776

NUNES
SOD HARVESTER



—trimmings—

TRITON CS-7 agricultural spreader-binder is detailed in a new brochure from Rohm and Haas Company. When added to various sprays, it promotes better spray distribution and retention and helps rewet and respread the spray deposits without product loss. It also aids in mixing of wetttable powders and liquid chemicals in tank-mix combinations. For a copy of the new brochure, write Rohm and Haas Company, Independence Mall West, Philadelphia, Pa. 19105.

HYDRILLA HIDEOUT was recently discovered in Florida's Lake Okechobee, reports Robert D. Blackburn. He and his staff at the USDA Agricultural Research Service station in Ft. Lauderdale, have found that in spite of active isolation and quarantine programs, hydrilla has "holed up" in the big Florida lake. If permitted to gain a significant foothold, this weed could disrupt the aquatic environment of this shallow-bottom lake, Blackburn said.

CONSUMER ALERT is the word from the Georgia department of human resources. They say a double infestation is moving through Georgia pine trees. Officials are cautioning property owners about the dangers caused by the southern pine beetle, and they are also sounding a danger signal about unscrupulous "tree doctors" who are pretending to cure the sick pines—usually unsuccessfully, but always at exorbitant cost. Georgia forestry commission director Ray Shirley says that an unusually severe invasion of beetles is damaging pine trees in the metro Atlanta area and a number of counties south of there. He stresses that self-styled "tree experts" are little more than confidence men, and will possibly do more harm than good in applying their remedies.

DOZING AT THE WHEEL is by far the most frequent cause of interstate truck and bus accidents where the physical condition of the driver is involved, says the Federal Highway Administration's bureau of motor carrier safety. In 400 accidents, 76 percent of the drivers fell asleep at the wheel. Use of alcohol was the second largest cause of accidents. Eleven percent of the 400 accidents were attributed to drinking. Other physical conditions found in the study were heart disease,

drug usage, and blackouts.

SOUTHERN PINE BEETLE has built up to explosive numbers in Ashley county, Arkansas. Left uncontrolled, it could virtually wipe out the pine forests of the state. It attacks and kills trees of pulpwood and saw log size. The beetle has caused heavy losses to timber stands in Texas, Louisiana and other southern states for several years. The Arkansas Forestry Commissions is making aerial surveys and issuing written notices by certified mail to landowners where infected pines are found. Owners must initiate control measures within 15 days. These include cutting and marketing infested trees and all pines within a 50-foot radius; cutting and burning of infested trees and all pines within a 50-foot radius; and cutting and spraying with BHC or Lindane in diesel fuel.

NITROGEN FERTILIZERS present no evidence of danger to man, animals or global environment, according to an investigation by the National Research Council. Dr. Charles R. Frink, Connecticut agricultural experiment station and a member of the council's committee that made the study, says that locally excessive levels of nitrogen compounds most commonly occur where wastes contribute nitrates to the ground water. These wastes include municipal

wastes, septic tanks and concentrations of animal wastes. Urban runoff and industrial wastes may also add nitrates. Frink says that continued research is needed to find ways of controlling possible entry of nitrogen into waterways from farmlands.

CONGRATULATIONS MR. J. G. PAGE of Walnut, Calif. We just received your reader inquiry card for more information about the International 2444 tractor and 70 flail mower mentioned in WTT August 1969: We're not sure whether this is due to post office error or that you were house-cleaning and noticed this ad in an old issue. One thing for sure, we'll expedite your request. We don't want the grass to get too too tall before you receive an answer.

FIFTY PERCENT of the birch trees in many southern Michigan cities are or will become infected with the Bronze Birch Borer, Michigan State University's Dr. Melvin Loelling estimates. The extension forester says that his beetle is greenish-bronze and invades birch trees planted in locations not native to the tree. Birches prefer the cooler, damper climate of northern Michigan and other northern tier states. Plantings elsewhere are generally subject to more insect and disease problems.

By **DR. ROBERT W. MILLER**
Assoc. Prof. of Agronomy
Ohio State University

Management Steps For Better Water Use

1. Mowing Practices—Lowering the mowing height reduces the efficiency of water utilization. As the height of mowing is lowered the number of roots produced and the depth of the root system is reduced. Higher mowed grasses actually have greater water use rates than low cut grasses but the loss in uptake of water because of poorer root systems more than overrides any advantage of lower mowing. Infrequent mowings also reduces the efficiency of water utilization for the same reasons. The use of a dull or improperly adjusted mower will increase the water use rate of grasses.

2. Irrigation Practices—Excessive watering of grasses result in a poor root system, increases the water use rate, and decreases water absorption by the plant.

3. Fertility Level — Excessive nitrogen fertilization of turfgrasses stimulates top growth, reduces root growth, increases the water use rate and lowers turf quality.

4. Turfgrass Pests — Turfgrasses injured by disease or insects will have higher water use rates than healthy grasses.

5. Traffic — Grasses worn by traffic have higher water use rates. Traffic should be managed whenever possible to prevent concentration of traffic.

6. Soil Aeration—Grasses grown on poorly aerated soil are inefficient in water utilization. Several management factors mentioned above effect soil aeration. Good management along with the use of mechanical devices for soil aeration will improve water use efficiency.