

sponse to three bid invitations.

2. Some programs may be so small that it would be wasteful to canvas everyone on a bidders list. In such cases, bid invitations may be limited to those bidders located within a reasonable distance of the work to be done.
3. Some programs may be of an emergency nature requiring immediate applications. Or sometimes, Federal appropriations or State or cooperator funds are delayed. Since we cannot issue bid invitations until funds are available to cover a program, he stated, emergency programs make it necessary to issue telegraphic bids. When a telegram becomes several pages long due to the details that are necessary, the cost would be prohibitive to

send telegrams to everyone on the bidders list. In such cases, the invitations may be limited to those operators who have done this work regularly for us and are known to be capable and equipped to do the job. Although it is the policy to canvas as many bidders as possible, we are not required by law to do so. The solicitations must be adequate to assure a competitive response.

Gieser told the group, "There is no need to belabor the point of increased cost of labor, aircraft, and materials. In spite of this, aerial application prices on our contracts have gone downward almost every year. For example, our first contract on grasshopper control, which was bid on an hourly basis, aerial application cost us about 70 cents an acre. Ten years later it cost about 50 cents an acre. In another 10 years,

the cost was reduced to about 18 cents an acre. Two years ago, we had a sizable area sprayed for less than 7 cents an acre. It is true that many improvements in insecticides and techniques have been made, but have they changed by 4000 percent?

"Obviously, he said," these prices can no longer go downward. There is no one in Government that does not believe everyone is entitled to a fair profit. Everyone is expecting aerial application prices to increase; however, it has reached a point now where prices cannot be doubled overnight. Several bids have recently been rejected because they were considered too high. The most recent example was on one of our programs in Florida. In this case, the first application on a large contract cost less than 9 cents an acre. When invitations to bid were issued for the second application on generally the same area, the lowest bid was al-

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PTO & Electric Seeders

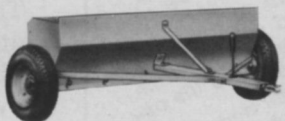
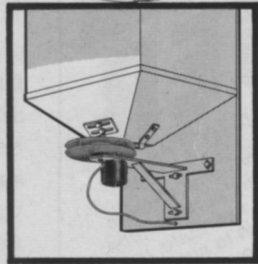
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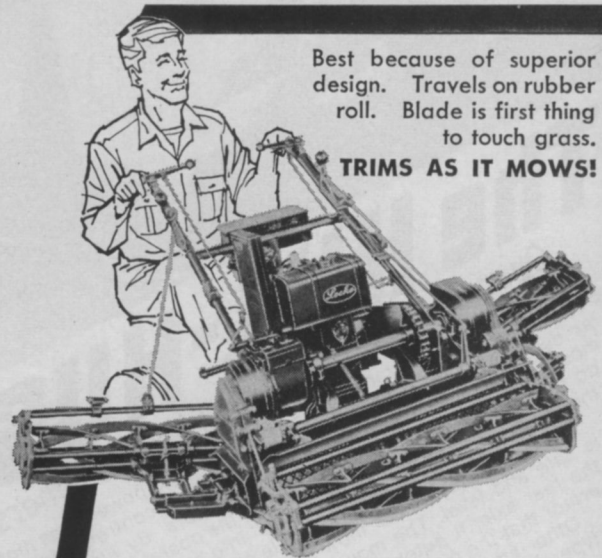
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most twice that of the first application and the bids were rejected.

"It must be remembered that the decision to accept a bid is not ours alone. These are cooperative programs. Funds are provided by States, counties, and private property owners. Budgeting people look at figures—they are not aware of your problems with aircraft, maintenance,

labor, or weather that influences operations. Budgets during pre-planning are now figured closely, based on the costs of previous similar programs. As stated before, the funds for a program must be available before bid invitations can be issued. When the bids are opened, if the cost for the program exceeds that amount, we could neither accept the bid nor treat only a portion

of the program. To do this would perhaps exclude parts of several counties and property owners who provided some of the funds," Gieser concluded.

The 1969 NAAA convention, slated again for the month of December, will be held at the Roosevelt Hotel, New Orleans, La.

Michigan Nurserymen Want Effective Licensing Law

The Michigan Association of Nurserymen, Inc. Board of Directors is interested in calling a meeting of the state's leading sod growers to consider stricter regulations concerning the growing and transporting of sod in their state.

Inspection and certification of sod and licensing of growers has been required by law since 1933, but the Department of Agriculture has been unable to effectively enforce the law, especially since mushrooming of the sod industry in recent years. Michigan reportedly raises more than twice as much sod as any other state.

The Plant Industry Division inspects and certifies sod shipped to states requiring such actions, but there has been no inspection or certification of sod shipped to other states or even within Michigan itself.

As it now stands, nursery stock must be inspected and certified before being transported and growers and dealers must be licensed, but a neighboring sod farm may ship turf at will without such safeguards to prevent the spread of pests and plant disease.

The MAN directors feel that stricter regulations would be beneficial to responsible sod growers, but they want to find out exactly what such a program would involve before any enforcing is done.



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The Slope Tractor will mow steep roadside and highway embankments yet the driver is safe and level. The mower is positioned on the surface being mowed, assuring the rear axle. 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 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.

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Theories Vary on Cause of Dutch Elm Disease

As the situation of the vanishing American elm worsens and no "sure cure" has yet been developed, scientists studying the matter have come up with theories that may lead to new ways of combatting DED.

The disease, thought to be caused by a fungus carried by the bark beetle, blocks sap circulation until the tree dies of thirst. The bark beetle, however, doesn't appear to be the sole cause of spreading DED from tree to tree.

It is a peculiarity of the elm that its roots connect to roots of other trees of the species when they meet underground. This causes "sap transfusion" from one tree to the next, says Dr. Albert E. Dimond, chief plant pathologist at the Connecticut Agricultural Experiment Station in Mount Carmel. Bud cells of

fungus infection are transferred in this manner, even if trees are as much as 50 feet apart, Dimond says.

Thus, elms not only need to be guarded against bark beetle invasion but must be isolated from contact with roots of infected trees, according to Dimond. To achieve isolation, trenches three feet deep are dug around a tree and treated with a root-killing substance — such as Vapan — or the chemical is injected deep into the ground in areas of possible root contact, he says.

Another theory of DED transference has recently been developed by Dr. Rene Pomerleau of the Forest Disease Research Laboratory in Quebec. He has found evidence that the lethal action of the fungus occurs in the leaves and leaf stems of the elm, rather than in the main sap channel, as previously believed.

In leaves, the sap flows

through tiny channels of the sapstream, similar to the capillaries of the bloodstream, says Pomerleau. It is there, he believes, that fungus buds do the clogging, as was indicated by infested elms in the experimental station. Individual leaves were often partially brown and partially green, as if strangulation was taking place within the leaf itself.

One way to attack this is the injection of fungus-killing chemicals into the tree or the ground around it. Tests at the Connecticut station indicated that injection into the trunk can retard the disease for several weeks, but to date this has not achieved a cure.

In Holland, according to Dr. Dimond, progress has been made toward developing a strain of European elm that resists the fungus, but it does not grow into the vase-shaped pattern that is characteristic of the American elm of Christmas card fame.

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Kentucky 31 Tall Fescue — A Shade-Tolerant Turfgrass

By F. V. Juska, A. A. Hanson, and A. W. Hovin¹

A good landscape plan will generally include turfgrasses grown in association with trees. Trees add to the aesthetic value of the landscape but because of shade can reduce the vigor and density of grass. At present, there are few grass species that are particularly well adapted for growing in deep shade.

Grasses and Shading:

At Beltsville, Md., a study was set up to evaluate seven red fescue selections in comparison with Pennlawn and common red fescue, Chewings fescue, Kentucky 31 tall fescue, and common Kentucky bluegrass under shade and in full sun. In September 1963, the fine-leaf and tall fescues were seeded at 4 pounds per 1000 square feet and common Kentucky bluegrass at 2 pounds per 1000 square feet. The plot size was 2 feet by 8 feet with 1-foot alleys between plots. Black plastic screens 10 feet by 20 feet long which excluded 80 percent of the light were attached to wood frames and placed on supports approximately 2½ feet above the plots over three replications. The other three replications were grown in full sunlight. In each of four growing seasons, the shades remained over the plots from May until the first of November. During this period shades were removed only for mowing and for making observations.

Soil and Management:

The soil, a silt loam, tested high in phosphorus, medium in potassium, and had a pH of 5.5.

¹ Research Agronomist, Agricultural Administrator, and Research Agronomist, Crops Research Division, Agricultural Research Service, U.S. Department of Agriculture, Beltsville, Maryland, respectively.

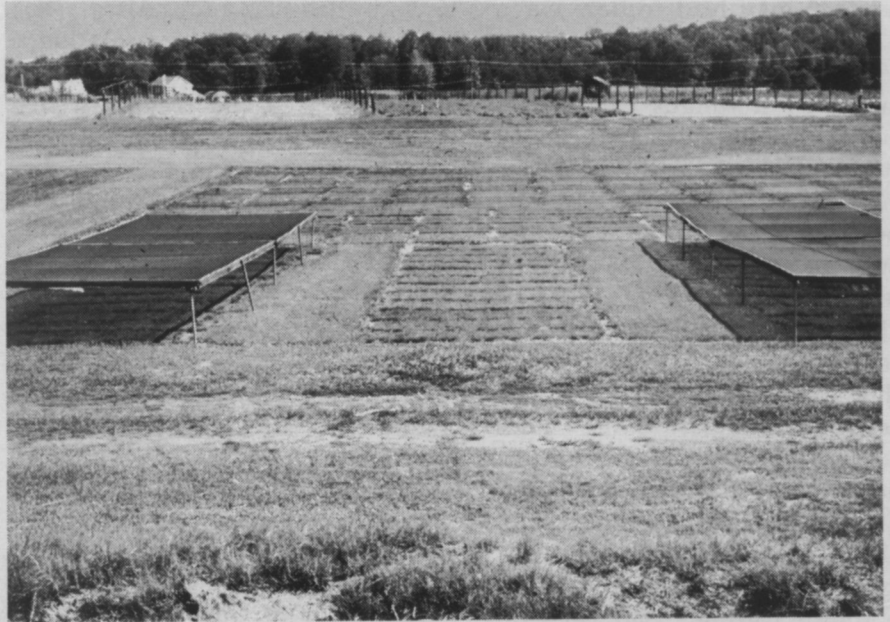


Fig. 1. Two replications of shaded plots. Center plots of grass were not shaded.

Lime was added at the rate of 1 ton per acre in 1964 and again in 1965. Potassium was added to bring this element to an optimum level. Nitrogen in the form of urea or ammonium nitrate was used. No more than 1 pound per 1000 square feet of actual nitrogen was applied at one time. A total of 3 pounds nitrogen per 1000 square feet was applied during the growing season. Both

shaded and unshaded plots were mowed at weekly intervals during the growing season and clippings removed.

Effect of Shade:

Turf quality scores for each of the 4 years for both the shaded and unshaded plots are given in Table 1. The scores for the grasses varied between years as would be expected because of climatic

TABLE 1. Performance of Some Cool-Season Grasses Under 80 Percent Shade and in Full Sun Over a 4-Year Period (10 = Best Quality)

Varieties	Under Shade					In Full Sun				
	1964	1965	1966	1967	Avg.	1964	1965	1966	1967	Avg.
Tall fescue										
Ky. 31	7.7	7.8	9.7	6.7	7.9	6.7	8.6	9.8	9.3	8.6
Red fescue										
Pennlawn	8.7	5.6	8.7	4.3	6.8	8.3	8.4	9.6	9.4	8.9
Common	7.7	3.8	7.4	3.9	5.7	8.7	7.2	7.3	7.3	7.6
Experimentals ¹	6.5	2.8	5.7	3.8	4.7	7.6	6.9	7.8	6.5	7.2
Chewings fescue	7.0	4.3	8.0	5.1	6.1	7.7	8.7	9.7	8.6	8.7
Ky. bluegrass										
Common	7.0	5.6	6.9	4.3	6.0	7.7	8.7	9.4	5.9	7.9

¹ Mean of seven selections

TABLE 2. Turfgrass Species Ranked According to Turf Quality (1 = Best, 1964-1967 Data Combined)

In Shade Rank : Species	Under Full Sun Rank : Species
1. Tall fescue	1. Pennlawn red fescue
2. Pennlawn red fescue	2. Chewings fescue
3. Chewings fescue	3. Tall fescue
4. Kentucky bluegrass	4. Kentucky bluegrass
5. Common red fescue	5. Common red fescue
6. Experimental red fescues	6. Experimental red fescues

conditions and time of year when notes were taken. Ratings were taken once in 1964, twice in 1965, and three times each in 1966 and 1967. The lower quality scores for 1965 resulted from ratings taken in the fall. Scores for 1966 and 1967 were taken in the spring, summer, and fall.

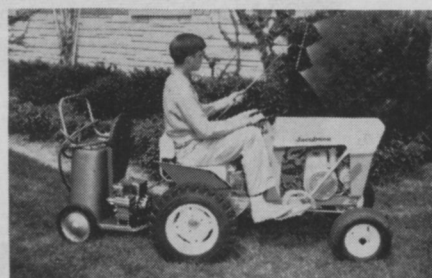
The grasses differed in their response to shade and sunlight. Differences between turf under shade and in full sunlight were evident after the first year. Turf under shade was lighter green, less dense, and more succulent. Average turf quality under shade, over all years, showed that tall fescue was about 14 percent better than Pennlawn and almost 23 percent higher than Chewings fescue. Pennlawn red fescue rated about 10 percent better under shade than Chewings. Lowest average scores for the grasses tested were assigned to experimental red fescue selections, presumably due to the narrow genetic base in this particular group.

In Table 2 all grass species are ranked as to turf quality in shade and sunlight. The three grasses that performed best under shade were also the best three in full sunlight, but not in the same order. Under shade, the turf quality for tall fescue was 23 percent higher than that for Chewings fescue; whereas, the difference between Pennlawn and tall fescue was only 3.3 percent in the sunlight. The most significant observation in this study is the excellent performance of Kentucky 31 not only under shade but also in full sunlight. Results

of this experiment suggest that Kentucky 31 tall fescue is adapt-

ed in the transition zone where a broader-leaved grass is not objectional for turf.

Lack of adequate moisture and soil fertility may restrict the growth and vigor of turfgrasses under heavy shade. The observations included in this report were based on the effects of shade alone, without obvious limitations in either moisture or soil fertility.



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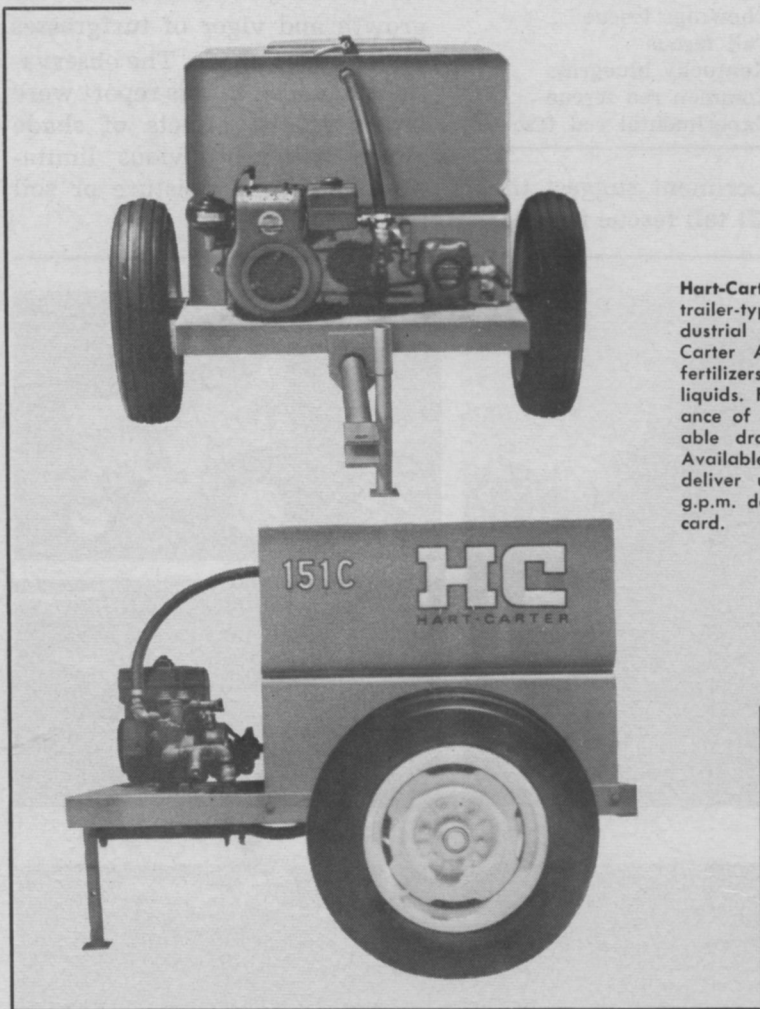
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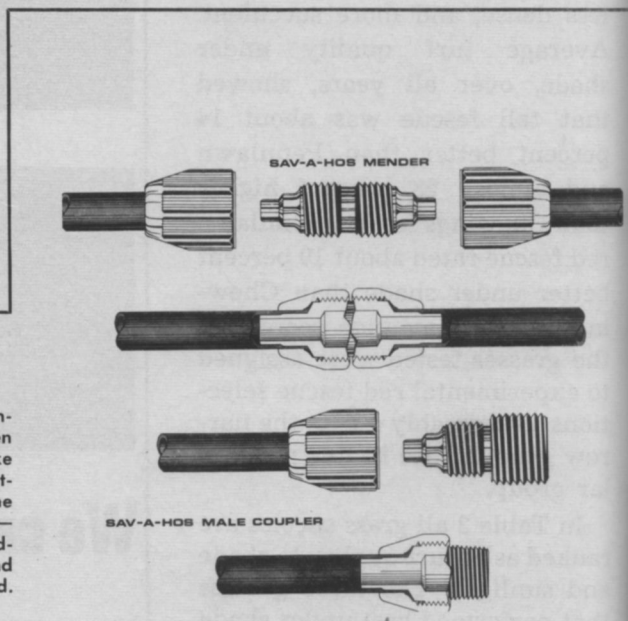
New Products . . .

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Hart-Carter Co., Minneapolis, Minn., now offers a new trailer-type sprayer for agricultural, commercial, industrial and municipal spraying. The versatile Hart-Carter All-Purpose high-pressure sprayer can apply fertilizers, disinfectants, control chemicals or other liquids. Features include 15-inch wheels, ground clearance of 14½ inches for use on rough terrain, adjustable drawbars and coated or stainless steel tanks. Available in three 300-gal. capacity models that deliver up to 10 g.p.m. or two 400-gal. units (22 g.p.m. delivery). For more details circle (701) on reply card.

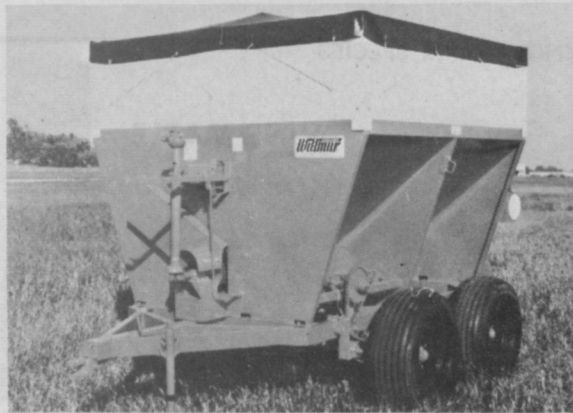
Bloomco, Inc., Portland, Ore., has come up with a new concept in repair couplers and menders for vinyl plastic garden hoses. Installation is easy, says Bloomco. Designed to make their own leak-proof flare without tools or ferrules, the fittings are reusable and won't work loose, according to the company. Fittings are made of durable, light green nylon — compact, streamlined with no bulky edges. Bloomco's menders and couplers fit ½" and 5/8" hoses, retailing at \$1 and \$1.10 respectively. For more details circle (702) on reply card.



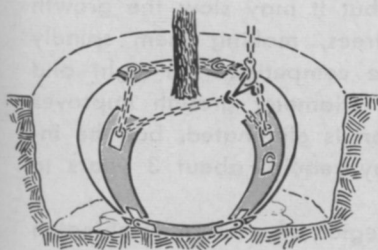
Vermeer Manufacturing Co., Pella, Iowa, has recently introduced its model CL-12 cable plow — ideal for installing lawn irrigation systems without the need to relandscape. Powered by 12-hp air-cooled engine, CL-12 features variable speed for digging in transport and independent power wheel drive for accurate direction control during plowing. Compact, it is easily transported via pickup, van or trailer. For more details circle (703) on reply card.



Mars Industries, Minneapolis, Minn., offers Chem-Spray, new sprayer that can be mounted on most small tractors. Pump produces low-pressure, minimum-drift 42" spray coverage at rate of 10 gals. per acre. Mountings of heavy-gauge steel; 5-gal. tank resists chemicals. For more details circle (704) on reply card.



Willmar Manufacturing has added two 6-ton models to its line of 2, 5 and 8-ton dry fertilizer spreaders. W-6 and W-6A, designed for intermediate-sized jobs, offer accurate spread pattern, dependable ground drive and "lifeguard" finish. W-6A also doubles as a tender. For more details circle (705) on reply card.



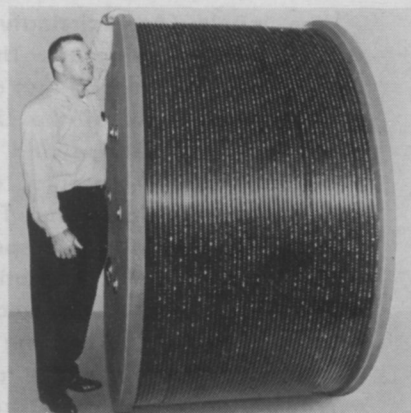
Beseler Equipment Co. of Minneapolis has developed the new Mark IV tree sling to speed up balling moderate-sized trees and large shrubs. Slotted lifting rings permit fast adjustment for ball size; new short lifting yoke is quickly shifted to control tree's tilt when loading or planting. Complete undercutting is not necessary. Wide belt sections prevent damage to ball. Sling folds ruler fashion for storage. For more details circle (707) on reply card.



Bunton Co., Louisville, Ky., offers options for its "Lawn Lark" mower units, such as the grass catcher attachment, shown above, operated by handle control. Clippings can be dumped into windrows or hopper can be emptied directly into containers. Another option shown is Bunton's easily installed riding sulky that allows an operator to ride open areas and medium grades. Standard features of Bunton's "Lawn Lark" line include finger-tip power steering, 7 forward speeds and adjustable cutting heights. For more details circle (706) on reply card.



Kemp Manufacturing Co.'s (Erie, Pa.) redesigned No. 2 "Gladiator" soil shredder processes wet or dry soil, sod, peat, silt and sludge. It offers automatic feeding drum, reversible shredding teeth, 30 to 40 cu. yd. per hour capacity. The 1200-lb. unit is 70" tall, 44" wide. For more details circle (708) on reply card.



Ridge Plastics Co., Jonesboro, Ark., offers lightweight, high-density polyethylene pipe able to be installed by ordinary tractor subsoil attachments at a 24-30' cover. Rated at 125 P.S.I., it won't slit, rot or pin-hole; lasts over 50 years, says Ridge. 10,000 ft. of pipe can be laid in 2 hrs., Ridge contends. Economical, too. For more details circle (709) on reply card.

VINE MAPLE

(Acer circinatum)

Drawing from: California Range Brushlands and Browse Plants, by Arthur W. Sampson and Beryl S. Jespersen. Calif. Agric. Expt. Sta. Ext. Ser. Manual 33.

Prepared by: O. A. Leonard, Botanist, assisted by B. J. McCaskill, Senior Herbarium Botanist, Botany Department, University of California, Davis, California.

Vine maple (*Acer circinatum*) belongs to the Maple Family (Aceraceae). The genus *Acer* consists of about 200 species that are well represented in the eastern part of the United States. Other species occur in Europe and Asia. Maples, well known for their ornamental qualities, are commonly used in landscaping. They also have economic properties, as some species produce hardwood lumber. In the springtime, sugars formed from starch present in the wood rays are secreted into the wood sap. When the wood is tapped at this time of year, bleeding takes place; the sap may be caught and concentrated into syrup for which the sugar maple (*A. saccharum*) is well known.

Vine maple is a reclining or vine-like or small tree, 5 to 35 feet high. Its leaves are simple, their blades 2 to 6 inches long and of the same width,

palmately veined with 5 to 11 lobes, dark green above and paler beneath. The petioles are 1 to 2 inches long and grooved. In the fall the leaves become a rich scarlet. The flowers are reddish-purple, occurring in umbel-like clusters of 2 to 10 or more. The twigs are purple.

This plant grows along stream banks and in well-drained shaded areas from the coastal mountains of British Columbia southward to northern California. It commonly forms an understory in pine, fir and coast hemlock forests from near sea level to an elevation of 5000 feet. Associated with vine maple is bigleaf maple (*A. macrophyllum*), red alder (*Alnus rubra*), and other woody species. Neither vine maple nor the other species may be any real economic problem in old virgin forests, but all of them may interfere in reforestation following either logging or forest fire. Vine maple, a vigorous sprouter, may not be a problem to, for example, Douglas-fir seedlings that require shade when young; but it may slow the growth of well-established trees, making them spindly and weak unless the competition for light and moisture is removed. Diameter growth improves when such competition is eliminated, but the increase in growth may require about 3 years to become significant.

In the Douglas-fir region of western Washington and Oregon, there are two general types of aerial sprays for release of existing conifers or preparation of areas for stocking by artificial means: bud-break spray (when buds are swelling) and foliage spray. Apparently there is but little transport of 2,4,5-T from leaves into the stems, so the foliage sprays are of minimal value. 2,4,5-T esters applied in oil allow both bark and buds contacted by the sprays to be penetrated. The sprays are applied by helicopter using a total volume of 8 to 10 gallons per acre. Such an application does not result in appreciable downward transport of the 2,4,5-T, so only the tops of the vine maples are killed. However, this is often sufficient to give the desired release necessary for the Douglas-fir growing just under the brush canopy. Newly planted fir may require an additional spray 3 to 5 years later.

Along rights-of-way, picloram can be used in conjunction with 2,4,5-T to control vine maple and other woody species when the plants are in full leaf. Fair to good control can be obtained, especially through reapplication. Kill is related to dosage; therefore, amounts can be increased in areas where it will be safe to do so.

2,4,5-T applied in diesel oil to the basal parts of the stem of the vine maple is reasonably effective. Such applications are, of course, limited to sites that can stand a relatively high application cost, such as along rights-of-way.

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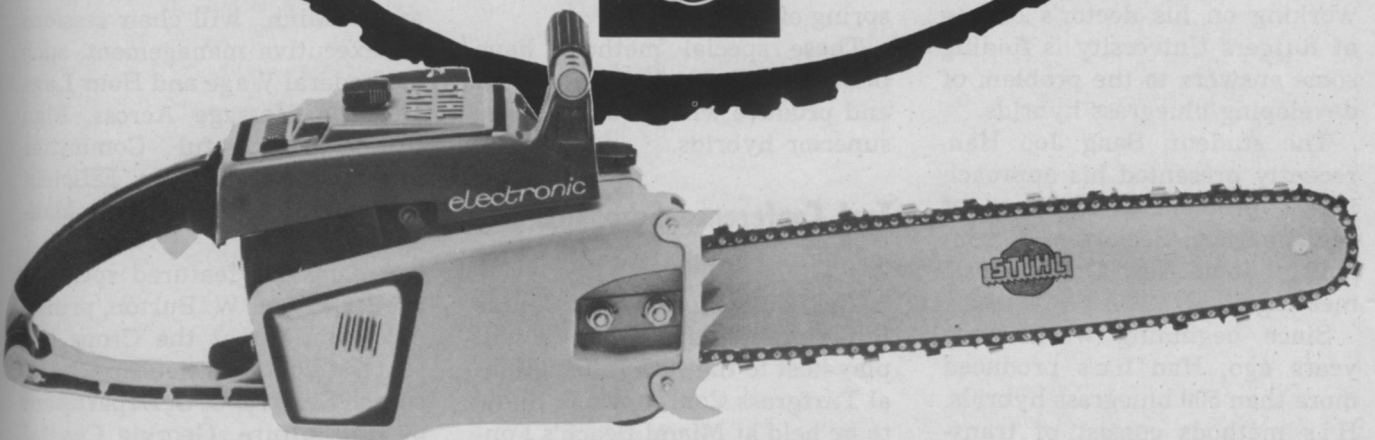
In keeping with our policy of offering the most advanced and most dependable in chain saws — we have incorporated solid state ignition into the STIHL 041 AV Electronic Saw. Other than eliminating the need for points and providing a molded circuit that is impervious to moisture, dirt, and temperature extremes — this model offers big 5 1/2 horsepower performance coupled with a light 15 1/2 pound weight and the fabulous new vibration absorbing AV handle.

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new

For More Details Circle (116) on Reply Card

New Hercules Film Depicts 'Visko-Rhap' Efficiency

Hercules Incorporated has recently made available a 16-mm color film depicting spraying techniques and effectiveness of its drift-resistant "Visko-Rhap" emulsion herbicides.

"Profiles in Spraying," filmed on location throughout the country, enables viewers to observe ways in which these commercially applied herbicides control weeds along roadsides and rights-of-way and in drainage control districts.

In addition to new spraying methods and equipment, the 14-minute film illustrates the drift-, washoff- and evaporation-resistant properties of Visko-Rhap weed killers, even when applied under varying weather conditions, according to Hercules.

Requests for the film should be directed to the Advertising Department, Hercules, Inc., 910 Market St., Wilmington, Del. 19899.

Koren Student Works On Turf Hybrids

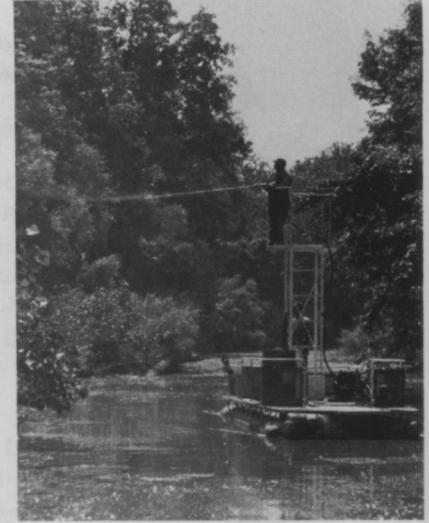
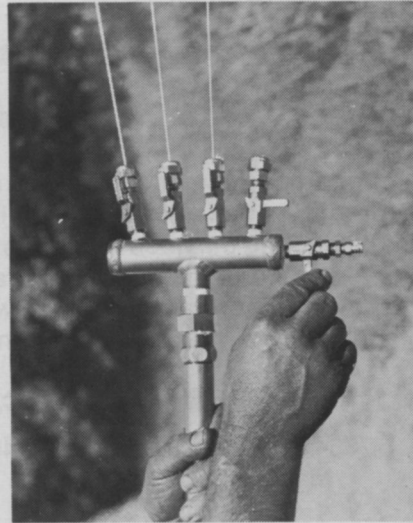
A young Koren student, now working on his doctor's degree at Rutgers University is finding some answers to the problem of developing bluegrass hybrids.

The student, Sang Joo Han, recently presented his approach to the problem to members of the American Society of Agronomy at their New Orleans, La., meeting.

Since beginning work three years ago, Han has produced more than 500 bluegrass hybrids. His methods consist of transplanting bluegrass seedlings to field nurseries in late summer, where they remain until January or February. They are potted and moved to the greenhouse to flower. Just before the flowers are due to open, Han dips each plant into 118° F. water for one minute. This kills the pollen but does not harm the remainder of the flower. Once



Several scenes from Hercules' "Visko-Rhap" film illustrate new methods and equipment used in applying the emulsion herbicides.



flowers open, he dusts them with previously selected pollen. The following year, he then selects hybrid seedlings from the offspring of this mating.

These special methods have permitted Han to make crosses and produce what promise to be superior hybrids.

Turf Conference Scheduled for Sunny Miami Beach

The South Florida Golf Course Superintendents Association will play host to the 40th International Turfgrass Conference & Show to be held at Miami Beach's Fontainebleu Hotel, January 19-24.

The program—which includes some 40 speakers, special clinics and an equipment segment entitled "The Greatest Show on Turf"—is geared for the benefit of superintendents, although anyone interested in turf maintenance and management is welcome, says Stanley E. Clarke, Jr., past president of South Florida

GCSA.

Dr. James R. Watson, Director of the Agronomy Division of Toro Manufacturing Co., Minneapolis, Minn., will chair sessions on executive management, such as: Federal Wage and Hour Law, Get the Message Across, Plan for a Successful Committee Meeting, Building an Efficient Staff and Better Business Management.

Among the featured speakers are Dr. Glenn W. Burton, principal geneticist at the Crops Research Div., Agricultural Research Service, U. S. Department of Agriculture, Georgia Coastal Plain Station; and Dr. Paul M. Alexander, professor of horticulture at Clemson University (South Carolina).

While husbands attend educational sessions during the day, wives will be treated to a complete program of social activities; so, ladies, start singing "Take Me Along!" so he'll get the message.