

.....phenyl Trichloroethane
.....phenyl O-p-nitrophenyl thiophosphate
.....Petroleum Derivative Solvent

.....
.....Min. Setting Point — 89° C.
.....3 pounds DDT per gallon.
.....1½ pounds Methyl Parathion per gallon.

READ ENTIRE LABEL. USE STRICTLY IN ACCORD-
ANCE WITH LABEL CAUTIONS, WARNINGS AND
DIRECTIONS; AND IN CONFORMITY WITH FED-
ERAL AND STATE REGULATIONS.

..... IN WARM AREA. PROTECT FROM CO

.....DISCARDING THIS CONTAINER, FILL IT WITH WATER
.....TABLESPOONFULS CAUSTIC (ALKALINE) SUBSTANCE
.....WASHING SODA (SODIUM CARBONATE) OR UN
.....CONTAINER WITH WATER AND

The most important 21 words in pest control

You see those 21 words—or words like them — on every pesticide container you buy. They're the whole key to pesticide performance.

It takes thousands of hours of testing to come up with label directions. Laboratory and field tests conducted by professional chemists and agricultural scientists. Tests that have to meet the most stringent standards of government agencies.

But the important thing is what happens when you use the product. Those thousands of hours of tests behind the label directions have but one purpose: to help you get the safest, most effective and economical

pest control possible. And following those directions is the only way to make sure you're getting it. That's why it's so important to read and understand the label before using any chemical product.



NATIONAL AGRICULTURAL CHEMICALS ASSOCIATION
1145 Nineteenth Street, N. W. Washington 6, D. C.



Skyworker was used to apply growth regulator on trees during May in Roanoke, Virginia.

By DR. T. O. EVRARD

Virginia Polytechnic Institute
Blacksburg, Virginia

Chemical Tree Pruning

A promising new control with plant growth inhibitors

PLANT GROWTH inhibitors have been used with beneficial effects by growers of tobacco, potatoes, onions and ornamentals. Now it appears that the custom applicator must become familiar with these chemicals, not only as grass growth retardants, but also more recently as retardants for shade trees.

The cost of annually trimming trees that are growing under power lines in cities is a large factor in electric utility maintenance. Also, in certain areas, opposition to tree trimming has sprung up from homeowners, garden clubs, and municipalities. Studies to find a way to reduce the amount of trimming required were initiated in the spring of 1964. The objectives of these studies were:

1. To maintain shade and ornamental trees in a more uniform, natural, characteristic shape over a longer period of time with a minimum of manual trimming.

Plant growth inhibitors are now being investigated as chemical pruners. The results contained in this article are from one year's experiments with this promising new application, Dr. Evrard points out, from his work with MH-30T and B-995-W50.

2. To reduce the number of cuts and open wounds caused by today's tree trimming practices. (These cuts are frequently left unpainted and may result in disease and insect invasion, a basis for much public resentment.)

3. To reduce cost of utility maintenance.

In the fall of 1963 a meeting was held at which representatives of the Appalachian Power Co., the Bartlett Tree Expert Co., the U. S. Rubber Co., and Virginia Polytechnic Institute were present. It was agreed in this conference that a cooperative project would be set up to test the effects of certain growth inhibitors on large city shade

trees which were trimmed for utility line clearance.

Officials of the city of Roanoke were contacted, the program explained, and permission obtained to initiate the experiment.

Two Chemicals Chosen

Two chemicals, MH-30T and B995, were selected for this study because of their previous history and usage on other plants. Areas were selected that contained problem tree species. The major species in the area were American and Chinese elms, sycamore, linden, tulip poplar, and silver and Norway maples. Certain trees were trimmed in the fall and winter and sprayed May 11; other trees were trimmed May

26 and treated June 18. All chemicals were applied to foliage run-off using a hand boom attached to a pressurized spray tank (40 psi) which was mounted on a Skyworker.

The length of new growth was measured and recorded on November 12 and is reported in Table 1. From the table it can be seen that new growth on American and Chinese elms, Norway and silver maples, and linden trees was markedly reduced. Other workers report similar retardation on sycamore trees, but in these trials sycamores showed only moderate indication of chemical inhibition. The spraying of these trees was suspended because of rain, however, and it is believed that some of the chemical was washed off the foliage, which reduced its effectiveness.

The growth of tulip poplars did not appear to be inhibited by the chemicals at the rates used. No rain fell on these trees for at least 24 hours after treatment. The "tulips" were in full bloom at the time of application, and no phytotoxic effects were noted.

Other growth retardants in addition to the two mentioned are being studied in a limited area on a wide variety of species to test for phytotoxicity.

Conclusions drawn from the first year's work are:

1. MH-30T at rates used did retard growth of certain trees under test. B-995-W50 was not generally effective in controlling tree growth and added little to the effectiveness of MH-30T when applied in combination with it.

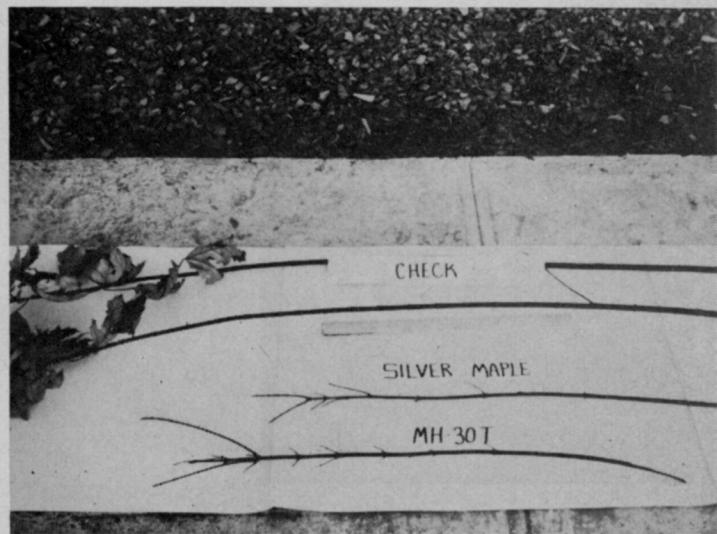
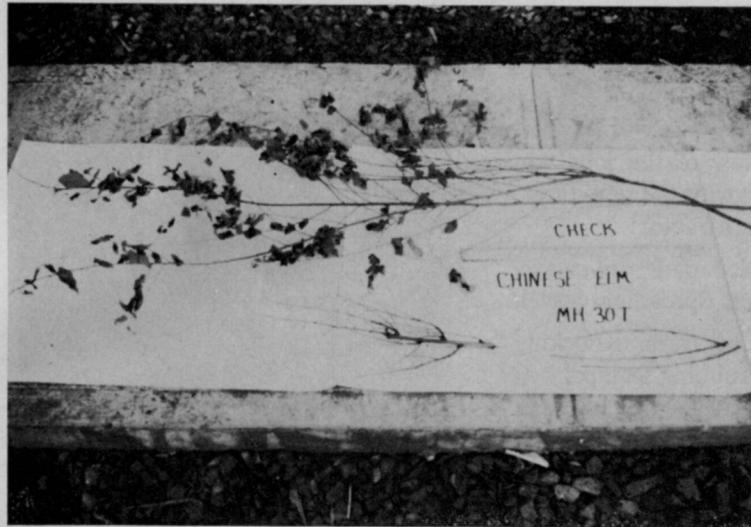
2. Rainfall within a few hours after chemical application reduced the inhibiting effects of the chemicals used.

More important, however, was the fact that a problem existed, and through cooperative research among consumer (utility), supplier (chemical manufacturer), applicator (CA), regulator (city), and university investigator, solutions were sought.

In the city of Roanoke 150 large shade trees were treated

with no adverse public sentiment expressed at the time of application or during the growing season. In fact, most people who inquired about the operation wished the program success. Plans for the second year in-

clude re-treatment of trees sprayed during the first year, general expansion of the program and comparison of application techniques. The last phase will include another cooperator, the equipment manufacturer.



Results with MH-30T on Chinese Elm (above), and Silver Maple (right).

Table 1. Average length in inches of new growth. Ten measurements per tree; at least three trees per treatment; trees treated in spring; measurements taken November 12, 1964.

Treatment	Chemical	Concentration	Species						
			Tulip Poplar	Amer. Elm	Chin. Elm	N'way Maple	Sycamore	Linden	Silver Maple
1. MH-30T		10,000 ppm*	39	22	11	15	61	25	25
2. MH-30T+		10,000 ppm+							
	B-995-W50	5,000 ppm*	35	22	14	13	60	21	27
3. MH-30T+		5,000 ppm+							
	B-995-W50	4,000 ppm*	43	15	18	18	72	65	23
4. B-995-W50		5,000 ppm*	39	44	46	20	48	52	37
5. Check			34	72	50	29	84	45	47

* Sprayed to foliage run-off

International helps take the drudgery out of spring work

Consider just a few of the jobs you could zip through with the new International® 2424 turf tractor:

Building new service roads, driveways, walks and terraces. Spreading gravel.

Planting or moving trees. Knocking out dead trees. Grubbing stumps.

Raking thatch, matted leaves, other debris. Aerating, fertilizing and re-seeding, all in the same operation.

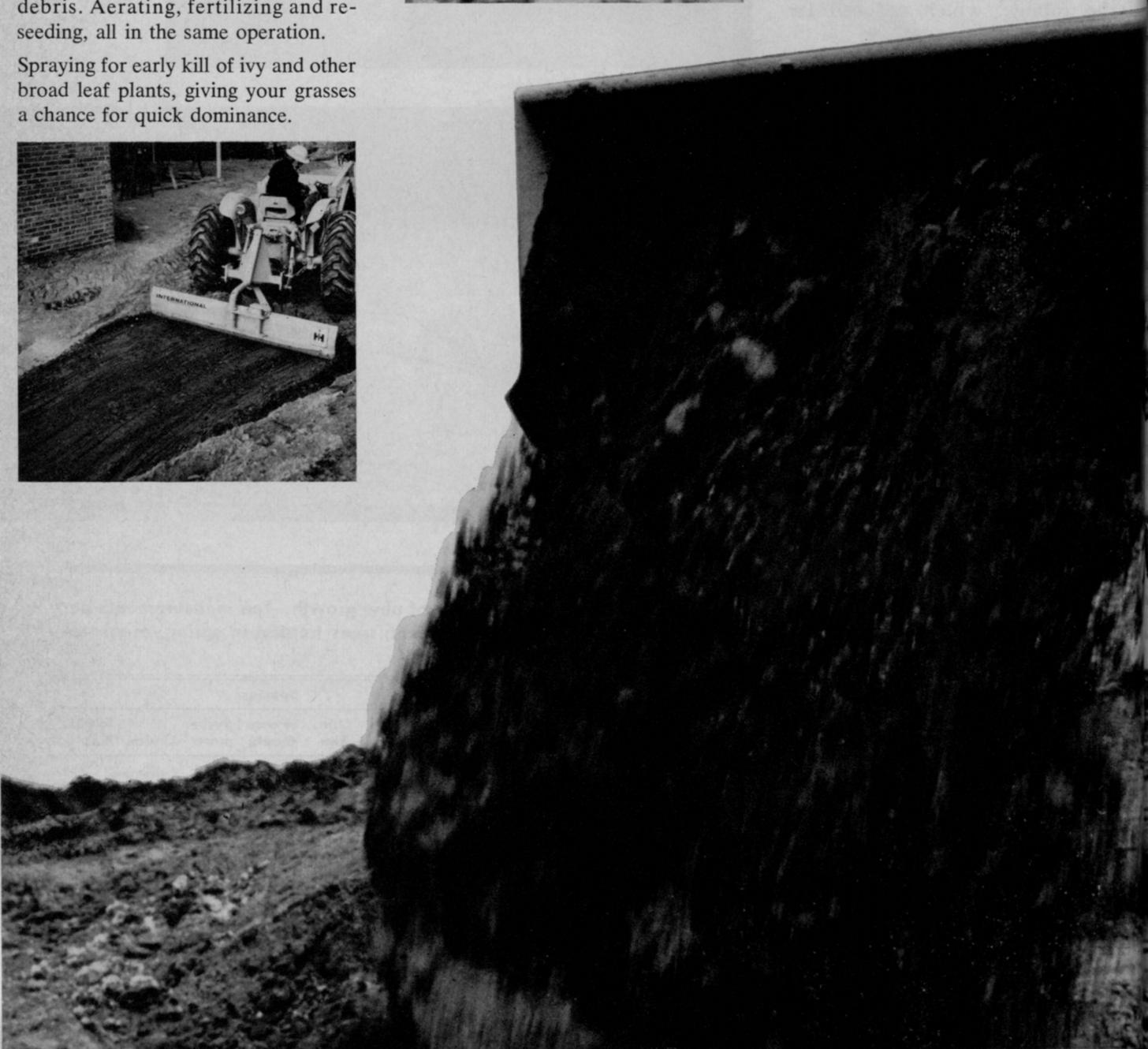
Spraying for early kill of ivy and other broad leaf plants, giving your grasses a chance for quick dominance.

Just a partial list of spring chores, but the 2424 will put you on top of them so fast you'll probably want to schedule other projects — the ones you've been putting off for years.

And this is the same tractor which will keep you ahead of your mowing later on. Quite a combination. 47 hp (43.5 diesel) in a low profile tractor that outmaneuvers every other tractor in the compact class.



The tightest turning radius (8½'). The shortest wheel base (70"). Only 51 inches to the top of the hood. And the only tractor in this class with full-time hydrostatic power steering.

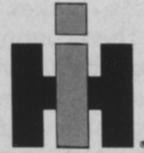


A differential lock that feeds power to both rear wheels regardless of traction. No spin-out. No gouging of turf even when you start up from a dead stop on an up-slope. On side hills it holds the nose straight, prevents down-drifting.



Dual range transmission with 8 forward and 2 reverse speeds (8 and 8 optional for loader work). Live, constant running power take-off. Draft-sensing 3-point hitch. Live hydraulics. Wide, high-flotation tires. And more.

You'll just have to get the rest of the story from your IH dealer. Maybe a demonstration? And he'll be glad to talk several different methods of financing. One, two or three years to pay. Deferred payments—up to three a year with no extra charge. Leasing. Leasing with a purchase option. Or you suggest something. He wants to make a deal!



INTERNATIONAL HARVESTER COMPANY

The people who bring you the machines that work



New **METER-MISER** is ...

LOOKING somewhat like a lawn mower, the new "Meter-Miser," being introduced by Amchem Products, makes it possible to combine the economy of using liquid chemicals with the safety of accurate drift-free application. Instead of cutting blades, however, the new mechanism controls vegetation through the use of a special applicator disc and chemical herbicides.

The new chemical applicator also eliminates complex metering and calibration, Amchem reports. Formulas recommended for use in the device are adjusted to the machine's tank capacity. For example, one can half fill the tank with water, add one gallon of Liquid Amizine Meter-Miser formula, finish filling the tank and spray. One five-gallon tankful of spray mixture is said to be enough to cover 4,840 square feet; nine gallons will control vegetation on an acre of land.

In operation, the new applicator puts down a standard 36-inch swath of the premeasured liquid formulas at a constant rate; the spray pattern is such that no area larger than a dime is left uncovered.

Additional attributes of the machine are that, being highly mobile, there is no need to drag supply hoses or carry heavy spray equipment. Lightweight, compact and inexpensive, it can be used by industrial, utility, institutional and other maintenance supervisors.

Specifications

Special appeal of the Meter-Miser to applicators is revealed in a listing of its specifications.



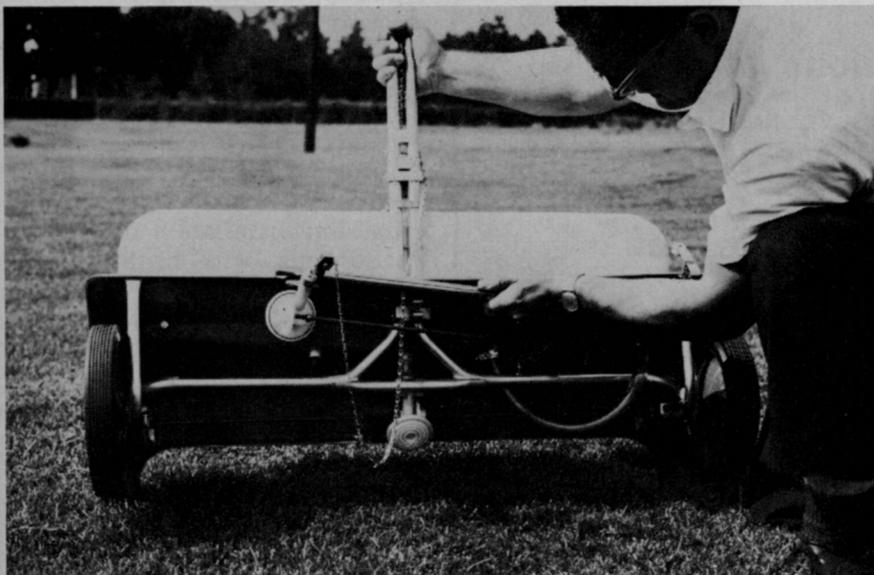
... Driftless Grounds Applicator

All parts that come into contact with chemical solutions and mixtures are made of corrosionproof plastics. The ruggedly built device weighs 30 lbs. empty; overall length is 54 inches with a handle 41½ inches long. Gravity flow supplies its centrifugally operated spray discs. Instant on-off control is actuated by the spring-loaded chain located on plated steel handles. Outside diameter of its rubber wheels is 10 inches. Outside width of the cowl is 41½ inches and its tank capacity is slightly more than

5 gallons. Because its spray-disc dispenser is so close to the ground, there is no chance of chemical drift. And, it's claimed, an operator can walk fast or slow without affecting the rate of application.

A limited number of demonstrator models now being tested by custom applicators show that the device will fill a need for use on smaller spraying assignments, especially over smooth terrain. This would include areas such as roadways, parking areas, and utility substations.

To double the output of Meter Miser, extendable arm mount is removed from storage space underneath hood and mounted on right wheel. The new extension allows operator to spray a 72-inch swath of chemical. Pattern is such that no area as large as a dime is reportedly left uncovered.



Non-corrosive plastic disc spinning under the hood of the Meter Miser applicator affords accurate dosage and drift-free operation. Design of the applicator disc coupled with the pre-measured liquid formula in the tank eliminates the need to calibrate the new chemical applicator.

User Comments

Luther Scott, grounds maintenance manager at Cedarbrook Country Club, Blue Bell, Pa., comments on the hooded construction of the Meter-Miser, noting that "... it allows me to get in close to ornamental shrubs without fear of drift. I use it to spray around the golf tees, greens and sand traps. Since it leaves wheel marks on the turf, I can see where I've been and don't have to be afraid of overdosing any particular section of our turf."

The machine is also being used on grass plots at Penn State. Dr. Joseph Duich also comments on the fact that the wheel marks left by the machine prevent overdosing with chemicals, but he offers the following caution. "If you're going to mix chemicals in the tank," Duich says, "be sure to add water first, then the chemical, then the remainder of the water. This prevents a concentration from building up at the outlet valve which could be harmful when the machine is started." Duich also has used

the Meter-Miser on his own lawn, filling it with DDT and Sevin for control of mosquitoes and lawn insects.

Stauffer's Lawn & Garden Center at Lititz, Pa., has advertised the Meter-Miser on a rental basis: \$.25 per hour (two hour minimum) and recommends mixing broadleaf weedkiller with liquid nitrogen for fast "green-up" on lawns. Other claims he makes in his advertising circular are that the Meter-Miser can be used "... at any time of day ... 31¢ will kill over 50 kinds of weeds on 1,000 square feet of lawn ... 10 minutes time will cover 5,000 square feet ... no guesswork ... feed and weed, apply fertilizer at the same time ..."

Ken Snyder, of Snyder's Tree Service, Martinsburg, Pa., says he has used the Amizine and Weedone Super D formulas for vegetation control and especially likes the machine's ability to "... get in around shrubs without hurting them."

Improved Model

A new feature of the Meter-Miser for 1966 will include a special 18-inch applicator disc attachment, mounted to the side of the present model. Besides doubling output capacity of the machine, the attachment is said to be ideal for use along fence-lines as it sprays through to the opposite side of the fence. Operating in tandem the two discs spray a 72-inch swath of chemical formula in a single pass.

The Meter-Miser is an outgrowth of Amchem's research into finding better, more effective and safer ways to apply industrial chemicals. The company's latest development in this area resulted in the introduction of the "Spray-Disc" applicator, a centrifugally operated system for metering and applying invert-emulsion herbicides. Mounted on a helicopter, the device allows the pilot-applicator to apply these heavy drift-free adhesive-type herbicides with near-pinpoint accuracy.

How to Calculate

Pounds or Gallons of Aquatic Herbicides from Water Surface Acreage

Determining the amount of aquatic herbicide needed for weed control in pools (ponds, lakes) often is a troublesome and wasteful task if dosages are not calculated correctly. Incorrect application rates can mean too much or not enough herbicide may be used, and either poor control or an uneconomical treatment will result.

When recommendations on the label, or from agricultural stations, are given in gallons or pounds of toxicant per surface acre, the only measure needed to calculate a *correct* dosage is the surface area of the pool.

Gallons of concentrate needed for treatment of a surface acre may be calculated as follows.

Formula:

$$\frac{\text{Recommended lbs. of toxicant per acre (A)}}{\text{Lbs. of toxicant per gal. of conc. (B)}} =$$

Gallons of concentrate needed for each acre (C).

Example:

(A) = 10 lbs. of toxicant desired for each acre, according to approved recommendations.

(B) = 8 lbs. of toxicant per gallon of concentrate in the aquatic herbicide you are using.

(C) = $\frac{10}{8} = 1.25$ gallons of concentrate needed for each acre.

If a pool surface is 30 acres, 37.5 gallons of concentrate will be needed ($1.25 \times 30 = 37.5$ gallons). Water may be added to the concentrate to facilitate adequate coverage during application.

Pounds of granules to apply for each acre, when recommendations are expressed in pounds of toxicant per surface acre, are calculated as follows. The actual percent of toxicant in the granules is given, by weight, on the label.

Formula:

$$\frac{\text{Recommended lbs. of toxicant per acre (X)}}{\text{Percent toxicant in granules (Y)}} =$$

Pounds of granules needed for each acre (Z).

Example:

(X) = 30 lbs. of toxicant desired for each acre according to approved recommendations.

(Y) = Granules are 15% toxicant, or .15 lb. toxicant per lb. of granules, as stated on the label.

(Z) = $\frac{30}{.15} = 200$ lbs. of granules needed for each acre.

If pool surface is 10 acres, then 2000 lbs. of granules will be needed. $200 \times 10 = 2000$.

Granules are usually distributed by the broadcast method, but may be applied in a slurry of water.

Mountain Men Meet Jan. 26-27 For 12th Regional Conference

A thorough exploration of the booming sod industry is on the agenda for the 12th Annual Rocky Mountain Turfgrass Conference at Colorado State University, Fort Collins, Jan. 26-27. Attention will be focused on the industry's production, marketing, and installation problems.

Sessions will begin with a weed identification contest to refresh delegates on weed types.

Talks by P. Eugene Heikes, extension weed specialist, J. W. May, and H. M. Hepworth, of the CSU laboratory, will reveal the newest test results in soil preparation, weed control, turf establishment, and maintenance.

Turf diseases and their relation to weed problems will be explained by Dr. Jack Altman, associate plant pathologist.

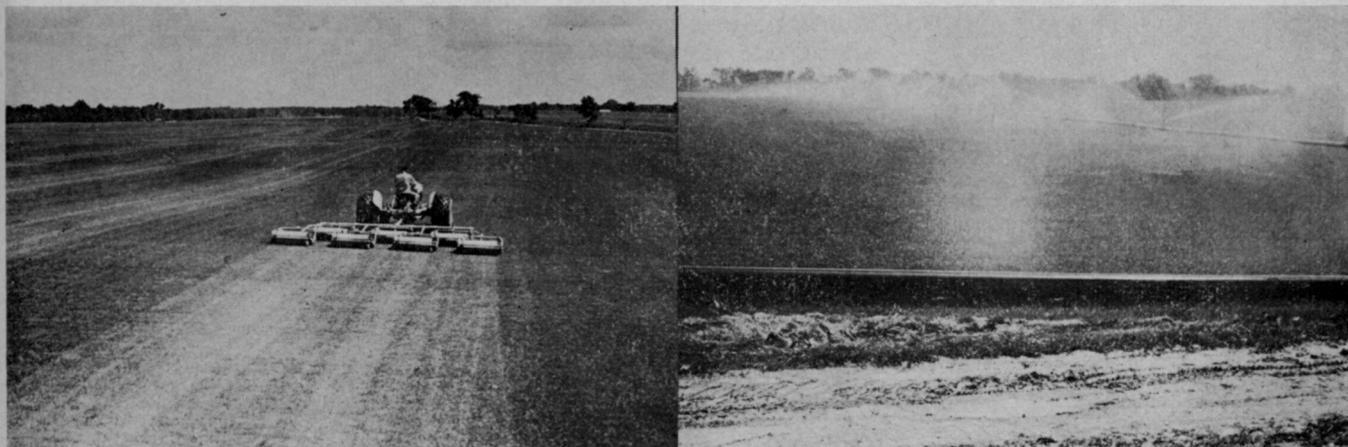
For more details write Prof. Charles M. Drage, Extension Horticulturist, Colorado State University, Fort Collins, Colo. 80521.

U. of Cal. Nursery, Tree, and Turf Men Meet In Feb.

An outline of the program to be presented to nursery, landscape tree, and turf men Feb. 23-25 at the University of California, Davis, indicates a diversified and educational program designed for all segments of the ornamental production industry.

Of special interest will be, "Problems Associated with Low Application Rate Sprinkler Systems and Specialized Turf." Also included are talks on, "Select Your Turfgrass Variety to Meet Your Specified Needs," and "Trees are an Integral Part of California's Highway Beautification Program." In another segment experts are to cover reduction of tree maintenance costs, land use and management as it affects the nursery industry, and a new concept titled "System Engineering Your Nursery Production."

Several outstanding speakers have been engaged for this three-day meeting. Further details will be provided in WTT next month.



"Cultivated" sod on Maryland farms is usually ready to harvest in 12 to 18 months after being fertilized and irrigated and mowed at 2 to 3".

Sod Industry—Big Business In Maryland

By ELWYN E. DEAL

Turf Specialist, Department of Agronomy, University of Maryland, College Park

Sod production and handling is one of the fastest growing industries in Maryland, certainly among agricultural commodities. According to a survey conducted by the Agronomy Department, in cooperation with the county extension agents, some 7,000 acres of sod valued at \$2 million were sold during 1962-63. Recent estimates show that figures for 1964-65 will be about twice that amount.

In the Baltimore and Washington, D. C., metropolitan areas, sod, rather than seed, is being used to establish new lawns around most of the buildings, housing developments, schools, and even private homes. With the tremendous building boom going on in these cities and in adjacent counties, a lot more sod will be needed in the future. Athletic fields, roadsides, parks, cemeteries, and golf courses also use large amounts of sod.

Maryland, located in the transition zone between areas where warm- and cool-season grasses are best adapted, has many types of grasses available. Several bermudagrass and zoysia varieties as well as bluegrasses, fes-

cues, and bentgrasses can be grown. Most of the sod currently used is Kentucky bluegrass or a mixture of bluegrass and red fescue.

4 Kinds of Sod Now Grown

Four general types of sod are being used in turf establishment. There are: cultivated sod, semi-cultivated sod, improved pasture sod, and unimproved pasture sod. Cultivated bluegrass sod is seeded and carefully managed specifically for turf use. Bluegrass or bluegrass-fescue mixtures are seeded at 50 to 75 pounds of seed per acre on a well prepared seedbed. The grass is fertilized, mowed at 2 to 3 inches, and usually irrigated. Sod is ready for cutting in about 18 to 24 months.

Semicultivated sod is often seeded at 25 to 50 pounds of seed per acre on a poorly prepared seedbed, is mowed occasionally at 3 to 4 inches, and not irrigated. It may be used for grazing during one or two seasons and requires 24 to 36 months to become well enough established for cutting.

Improved bluegrass pasture

sod comes from pastures which were used several years for grazing or hay, then the cattle removed for about one year before harvesting sod. During that year the grass is fertilized and mowed at 3 to 4 inches to produce a thicker sod.

The unimproved pasture sod, just as the name implies, is harvested immediately after the cattle are removed. No effort is made to improve the quality of the grass. Such sod is frequently used on slopes, fills or in ditches where cover is needed very quickly and quality is not too important.

Quality Specifications Needed

Unfortunately, specifications are not always set up for purity and quality of sod used around many buildings and in housing developments. Building contractors responsible for the lawn are often more interested in cost rather than quality of the grass. As a result much uncultivated sod from worn out pastures has been used in the past. Weeds, clover, and pasture-type grasses have been brought into the lawn and the homeowner or building



Properly watered and managed after being transplanted, bluegrass sod will continue to grow after installation.

superintendent has to contend with them later. Recently, however, with more high quality sod available at lower prices, and with increasing public demand for better sod, conditions have improved.

Sod prices in Maryland range from about 6 cents per square yard for semicultivated bluegrass sod uncut in the field to \$12 per yard for some of the new bermudagrass varieties. The average price for high quality common Kentucky and Merion bluegrass cultivated sod is 40 to 55 cents per yard, cut, and delivered to the buyer. Meyer zoysia, the most popular warm-season grass in the state, usually sells for \$1.50 to \$2.50 per yard or 5 to 10 cents per 2-inch plug.

Other popular grasses available in Maryland include Tufcote, U-3, and Tifgreen bermudagrasses; Emerald and Midwest zoysias; Penncross bentgrass sod, and Arlington and Congressional bentgrass stolons.

Because of the tremendous increase in popularity of sod, many farmers and other land owners are converting farm acreage to sod production. Numerous requests for information on sod management are received at the University of Maryland each month. Among the list of "other land owners" are businessmen, military personnel, doctors, and others who have retired to the "country." They view this as an opportunity to conserve soil and water and at the same time receive a profit from their land.

Several growers in Maryland

now have as much as 2000 or more acres of land in cultivated sod. They use different planting dates so that sod is ready to harvest at various times rather than all at one time. New growers usually start with a small acreage and gradually build up the size of their operation.

Mechanized Sod Cutting Preferred

Presently most of the sod is cut with the usual self-propelled sod cutter. Then it is rolled and loaded on trucks by hand. Much of the hand labor will probably be eliminated in the near future with the development of machines to cut and roll or fold the sod in a single operation. Sod cut in short lengths can be folded and placed on pallets for loading and unloading with a forklift, thus increasing the speed of operation and reducing expenses.

One zoysia grower in Maryland has developed a highly mechanized system for cutting and packaging Meyer zoysia plugs. A self-propelled plugger cuts several rows of 2-inch plugs at a time and loads them into boxes. The boxes are hauled to a packaging shed where each plug is carefully examined for purity, uniformity and quality before being packaged for sale in retail stores in the area.

Most of the sod in the state is produced by reputable growers. However, there are some sod contractors who still buy poor sod very cheap, usually old pastures, and do a poor job of installing the sod. A strong organization of qualified sod growers and contractors is badly needed to help combat this situation. Much could be accomplished if a unified effort is made to discourage this type of operation. An attempt is now being made to form such an organization.

Because of the long period of time now required to produce marketable bluegrass sod—often 18 to 36 months—the Agronomy Department at the University of Maryland has recently started a research project to find ways of reducing the time to 12 to 18 months or less if possible. For producers who market sod as



Rolls of top-quality Merion bluegrass sod, one square yard each, ready for installation at a new construction site.

their major source of income, time is a very important factor.

Construction Boom Sod Boom

With the construction boom expected to continue in and around Maryland, the sod market is expected to grow at a very rapid rate. High quality sod of adapted grass varieties is certain to be in great demand as consumers are better educated about the value of using good sod rather than poor quality cheap sod.

V-C Chemical Grows in Texas

Expansion of a fertilizer marketing program into southern Texas is announced by V-C Chemical Co., the agricultural chemicals division of Mobil Chemical Co.

V-C president Charles T. Harding says the company will market nitrogen as well as other fertilizer materials and agricultural chemicals from its Lubbock and Pecos headquarters. Stafford L. Beaubouef, formerly with John Deere Chemical Co., will direct operations. Distribution points are established from McAllen in the east to Fabens in the west.

Rutgers Renames Ag College

Known for more than a century as the College of Agriculture, this Rutgers University (New Brunswick, N.J.) school has been renamed the College of Agriculture and Environmental Sciences.