



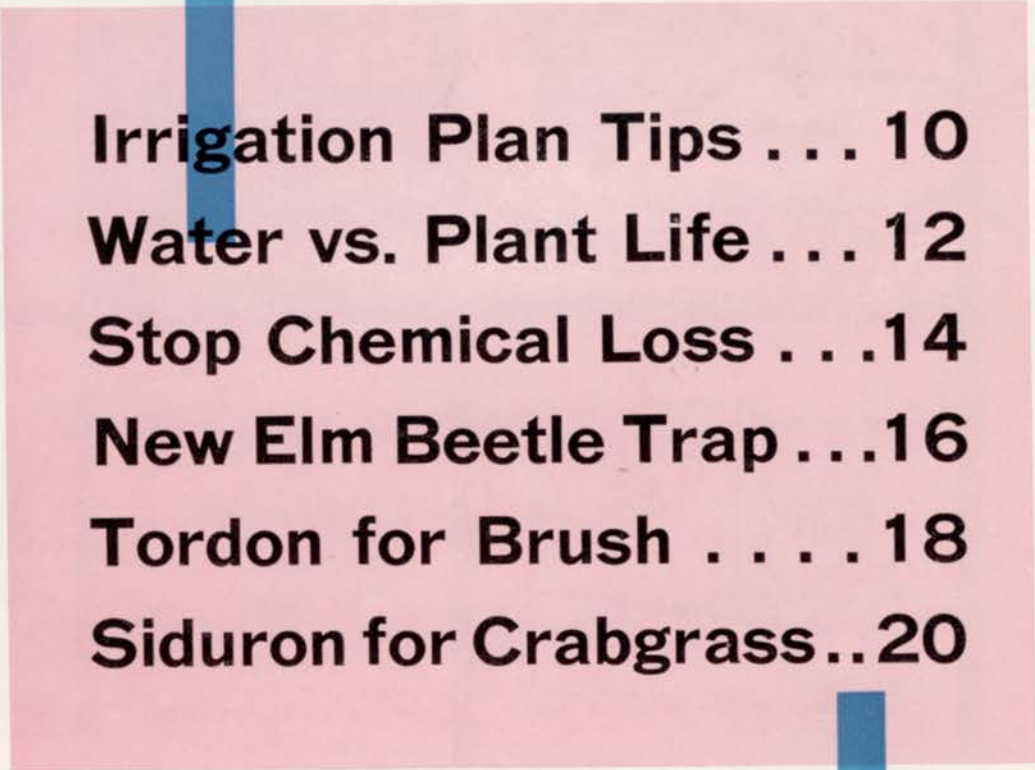
WEEDS

TREES

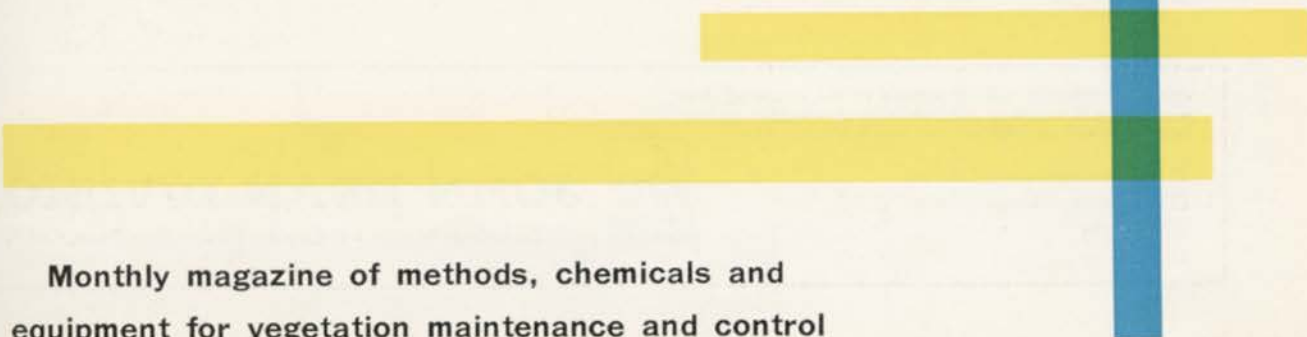
and TURF

FORMERLY WEEDS AND TURF


April 1966

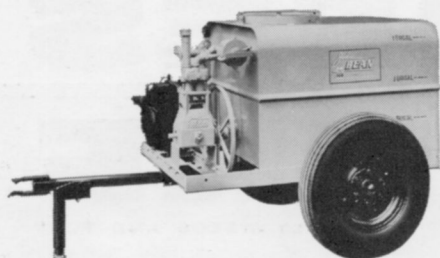


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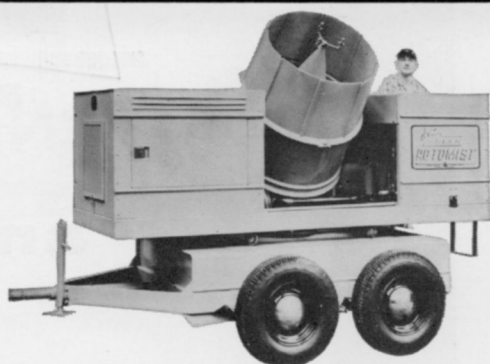
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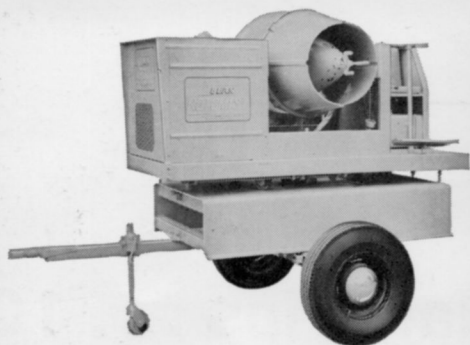
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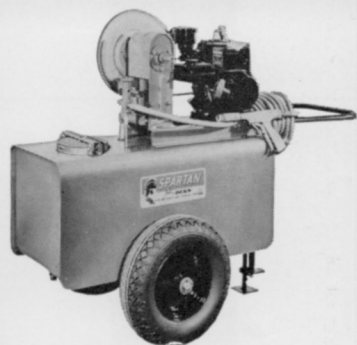
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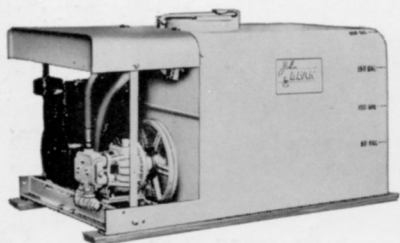
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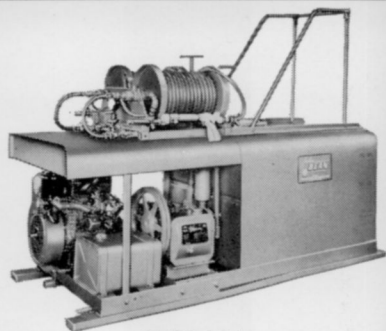
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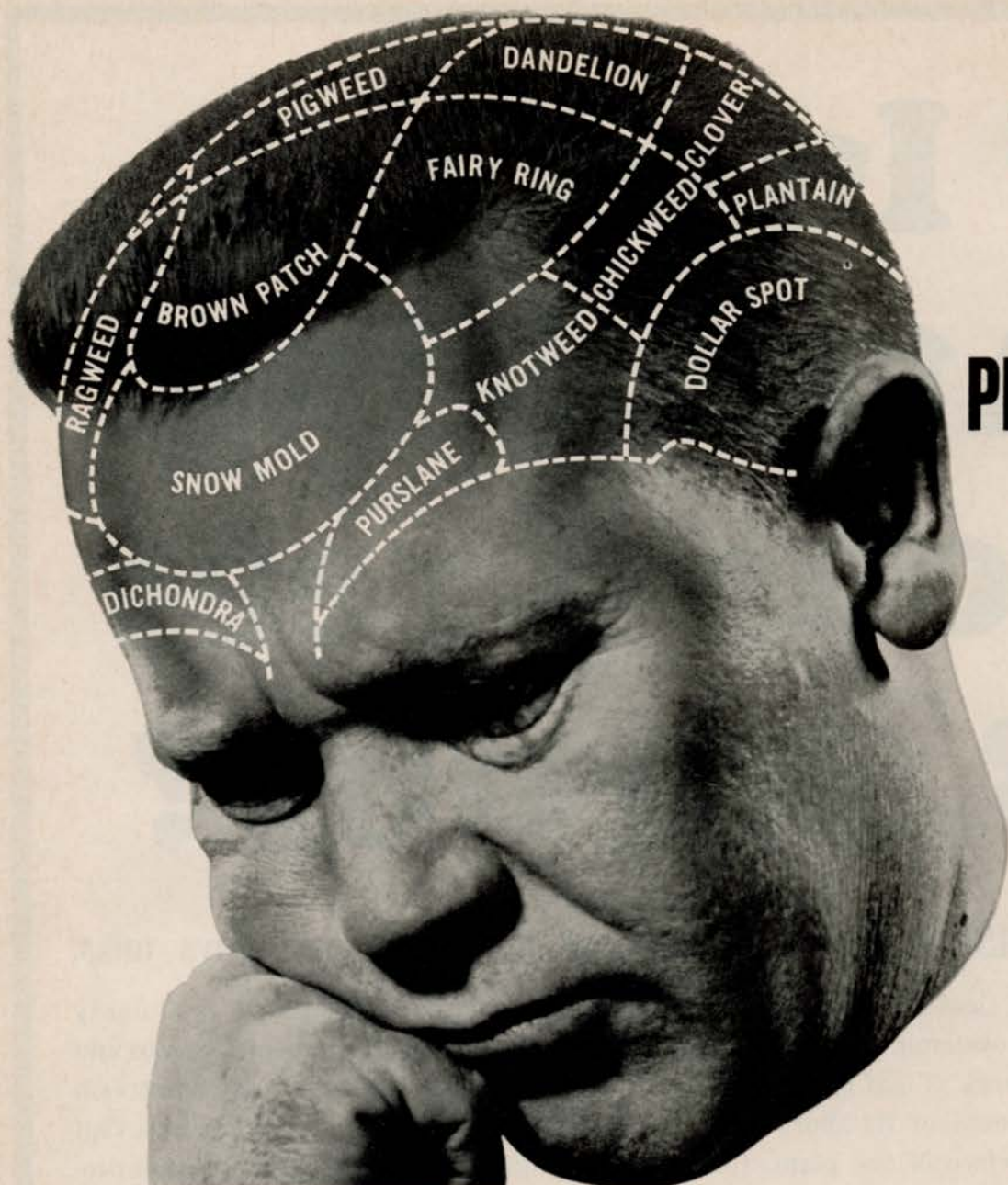
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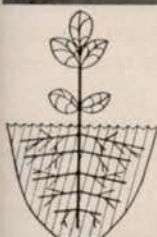
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WEEDS TREES and TURF

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April 1966

Volume 5, No. 4

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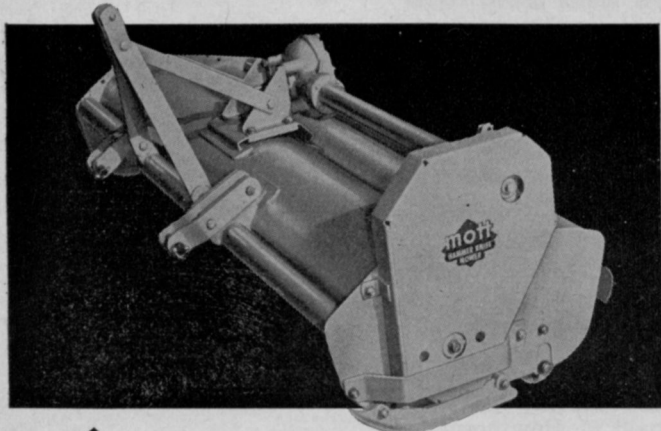
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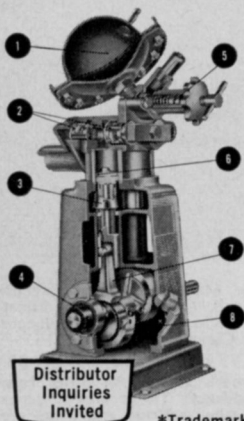
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Dreaming?

A release from the U. S. Department of Agriculture the other day says development of equipment, and techniques for applying a pesticide, should parallel development of the chemical itself. Reasoning is that evolving specialized equipment and techniques to deposit a chemical will increase the material's effectiveness and "probably reduce substantially the amount of the pesticide needed for optimum control of pests." This in turn, the story went on, would lower costs and reduce drift and residue hazards to man, animals, beneficial insects, and crops.

Because of the increasingly cumbersome Washington maze pesticide manufacturers go through to obtain label approval, applicators might have to wait another year or two to be able to use a new pesticide if equipment had to be specially tailored for it. As it is, chemical manufacturers must sit on their hands for from six to nine months awaiting a verdict on their candidate, only to hear, in some cases, that revisions must be made and the new label resubmitted to once more go through the interdepartmental system which must now okay every statement that goes on a pesticide.

Quite naturally chemical manufacturers are anxious to have their products put through equipment that will give the best results. Equipment makers, too, have a very real interest. We have a letter from a sprayer manufacturer who says he has very little liaison with pesticide formulators. He wishes for closer cooperation so tank linings, hoses, nozzles, and other fittings will better withstand the unanticipated deterioration that might result with a newly introduced chemical.

It makes good sense that these two sources of supply to the vegetation maintenance and control field should effect a closer relationship. But to withhold a chemical until tailor-made equipment has been designed is an unrealistic approach which could have devastating effects on both the public and vegetation controllers.

The USDA says more basic research is needed to determine how the movement of chemical particles is affected physically once they leave the applicator. Additional research is needed, they say, on such forces as inertia, aerodynamics, gravitation, electrical charges and temperature differences as they affect the safe efficient use of chemicals to control pests. Agreed. But will the bugs stop multiplying until we get a completely harmonious marriage between the chemicals used to control them and the equipment used to apply the chemicals?

WEEDS TREES AND TURF is the national monthly magazine of urban/industrial vegetation maintenance, including turf management, weed and brush control, and tree care. Readers include "contract applicators," arborists, nurserymen, and supervisory personnel with highway departments, railways, utilities, golf courses, and similar areas where vegetation must be enhanced or controlled. While the editors welcome contributions by qualified freelance writers, unsolicited manuscripts, unaccompanied by stamped, self-addressed envelopes, cannot be returned.

"COPPER SULFATE AND CONTINUAL SAMPLING KEEP ALGAE AT A MINIMUM"

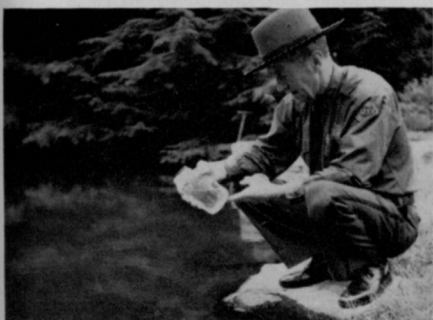
states Alan H. Ketcham,
Superintendent of Supply,
Stamford Water Company,
Stamford, Connecticut



Alan H. Ketcham, Superintendent of Supply and William Bartscht, Watershed Supervisor plan an all-out attack on algae.

"One of the most important activities of water management is a constant check not only of reservoirs but of the complete watershed. In our case, this means an area of 23 square miles, including numerous small lakes and ponds. Because some of these small bodies of water grow algae as if specially designed for the purpose, we treat them, as well as our main reservoirs, with copper sulfate which we have always found to be a most effective algicide."

Chartered in 1868 when it operated one



William Bartscht, Watershed Supervisor, continually samples water from the reservoirs and from outlying ponds.

reservoir and served a city of 8,714, the Stamford Water Company today operates 4 reservoirs and provides water for 90,000.

Supply Superintendent Ketcham says, "Our main distribution reservoir is a lake holding 512 million gallons. We treat this lake with copper sulfate two or three times a year depending on the algae problem. Using a work boat which drags suspended bags of copper sulfate crystals, the operation takes one day and uses about 1,700 pounds of copper sulfate."

"Our inspectors who are regularly in every quarter of the property, are constantly on the lookout for algae growth, particularly in remote shallow sections. When necessary, treatment with copper sulfate is directed at these points of algae concentration. We always try to catch algae at the start of growth and treat at once before it has a chance to spread."

"We have sometimes traced algae problems to untreated residential ponds. We find that the average homeowner does not fully comprehend pond management and maintenance so we try to advise him. This is really worthwhile because whenever

algae is allowed to grow unchecked there is danger of it getting into the main reservoir, and it is always simpler to treat algae confined to a small pond."

"The men on our inspection team are uniformed, travel in radio-equipped cars and work with Health Department men from two states. Water is constantly sampled and examined microscopically. Copper sulfate purchased in 100 lb. bags is stored at the reservoir itself, ready for use at any time."



Shallow ponds soon become clogged with algae unless treated with copper sulfate.

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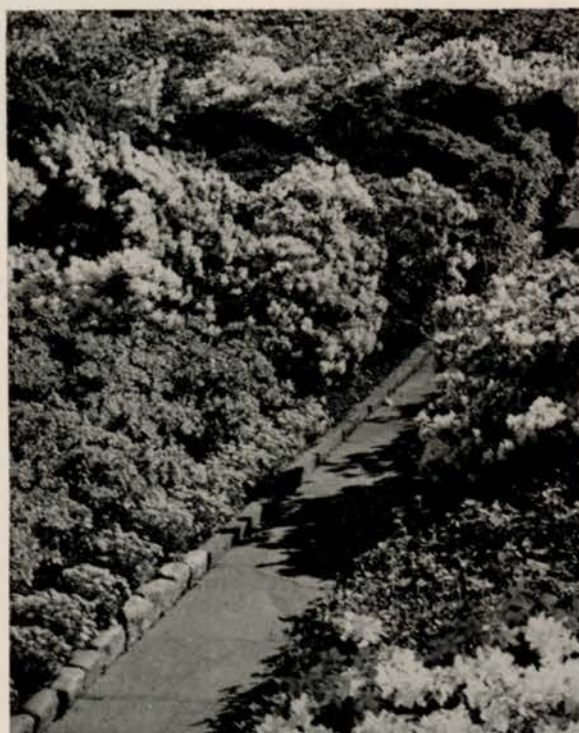
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Use EPTAM on your next weed control job. For full details on how to use it in ornamentals, consult your supplier or return the coupon.



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BETASAN also gives you excellent control of *poa annua* (annual bluegrass). It even controls some annual broadleaf weeds. Application dates vary according to the weed. For instance, *poa annua* infestations are best controlled by late summer or early fall applications, since in many parts of the country it is a winter annual.

Return the coupon for your free copy of our brochure, "BETASAN Control for Crabgrass and *Poa Annua* in Greens and Turfs," Stauffer Chemical Company, Agricultural Chemical Division, 380 Madison Avenue, New York, N. Y. 10017.

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By

DR. DALTON S. HARRISON¹

Associate Agriculture Engineer
Agriculture Extension Service,
Gainesville, Florida

THERE ARE many variations and types of sprinkler irrigation systems for use on turf-grass; however, they are generally divided into three main types: portable, semipermanent, and permanent. The choice of any system should be made only after considering the total cost of the system (fixed and operating), labor costs and labor required, and availability and suitability for your specific operating conditions.

Portable Systems

There are three types of portable systems: high-volume sprinklers or guns; medium-pressure (40-60 psi) sprinklers; and traveling sprinklers. These systems have the lowest initial cost per acre, but labor requirements and labor costs are the highest of any system. They are well suited for turf nurseries, athletic fields, and areas not needing frequent irrigations.

Semipermanent Systems

Semipermanent systems have permanent mainlines and submains, while most of the laterals are portable. They are especially suited to large areas where line moving is difficult and requires extensive labor. Here, the mains and submains can be moved with relative ease. In general, semipermanent systems are the

"happy medium" between a portable and a permanent system. They may be designed for high-volume guns or medium-pressure sprinklers.

Permanent Systems

Permanent systems have both the mains and laterals permanently installed and are often called "the solid set" systems. Equipment and installation costs are the highest of all sprinkler systems. However, labor requirements are the lowest of any system; this is their chief advantage. They are best suited for areas needing full-season irrigation and where labor is not desired. Industrial sites, cemeteries, parks, and small nurseries are well adapted for these systems.

Permanent systems can be installed that operate all the sprinklers in sequence, with time-clock and automatic valve mechanisms. A definite advantage of the sequencing system is the reduction in pipe size and pump and power requirements.

Labor requirements and approximate cost range of the different irrigation systems are

Table 1. Types, approximate labor costs, and approximate cost of some conventional sprinkler irrigation systems for turf.

Type System	Initial Cost	Estimated Initial Cost* Per Acre	Annual Labor Use	Approximate Man-hours Per Acre-Inches
A. Portable				
1. Large Guns	Medium	\$150-250	Medium	0.5 -0.75
2. Sprinklers				
Med. Pressure	Low Med.	\$125-200	High	0.75-1.0
3. Traveling	Low	\$100-150	Medium	No Est.
B. Permanent (Solid Set)	High	\$500-1000	Very Low	Very Low

*including well, pump and motor

What t

for Industrial Sit

summarized in Table 1 which is based on past experience and retail prices, subject to change.

Irrigation Depends on Capabilities of Grasses

When and how much to irrigate depends on (1) the rate the grasses use water, usually expressed in inches per 24 hours, and (2) the water-holding capacity of the root zone in the soil. Grasses will use approximately 0.10 to 0.25 in. of water per day, depending on time of year, temperature, and day length.

Best growth and yield response may be expected if you begin to irrigate when 50% to 60% of the available moisture in the active root zone is depleted. This is usually expressed in inches of available water. The active root zone is usually from 18 to 24 inches deep.

To determine the net and gross amount of water needed at each irrigation period, the following factors must be known.

- (1) Available moisture capacity of the soil, in inches of water per foot depth of soil (Table 2), and effective root zone (18-24 in.) depth.
- (2) Number of acres to be irrigated.
- (3) Moisture requirements of the type grass in inches per 24 hours.
- (4) Application rate, and efficiency, (usually 70% for daytime operation and 80% for nighttime operation. Time of day and wind influence are also factors which cause high evaporation.
- (5) Number of hours the irrigation system operates each day.

With this information, we can calcu-

¹Talk presented at 13th Annual Turfgrass Management Conference, University of Florida, Gainesville, Florida, October 6, 1965.

Consider when you plan Irrigation Systems

Athletic Fields, Cemeteries, and Turf Nurseries

late the pump capacity (output) required in gallons per minute (GPM).

For Portable Systems:

$$\text{GPM} = \frac{453 \times I \times A}{H \times D}$$

Where I = Inches water to be applied

A = Acres to be covered

D = Days required to cover

H = Hours of operation per day

GPM = Pump capacity, in gallons per minute

453 = A constant

For Permanent Systems:

Precip. Rate Desired	GPM/Acre
0.15	67.5
0.20	90
0.25	112.5
0.30	135

Soil Holds Water

Before we begin to design an irrigation system, we must have certain information on soil moisture. We must know the available water-holding capacity of the soil in the root zone of the plant (inches of water per foot depth of soil). This helps determine the amount of water to apply each time you irrigate and the frequency or interval of irrigation. For example, assume that your soil type is Lakeland fine sand, which has a water capacity of 0.50 inch per foot depth, (Table 2), and your turfgrass has an effective root zone depth of 2 feet. Then, 0.5 inch/ft. depth \times 2 ft. = 1.00 inch available water capacity. Then, $\frac{1}{2} \times 1.00$ inch = 0.50 inch water to apply at each irrigation. However, since our irrigation efficiency in Florida is about 75%,

we need to apply $\frac{0.50}{0.75}$ or about 0.65 inch per application.

Research has shown that the

daily maximum consumption of water by certain grasses is about 0.25 inch per day. From June to August, then, our irrigation interval or frequency would be

$\frac{0.65}{0.25}$, or about every 3 days. The

frequency of irrigation is not a set figure but is based upon soil moisture and plant relations. There will be intervals 2 to 3 times as long between irrigations in winter months as in hot summer months.

Supplementary irrigation must be designed to have the capacity to apply the necessary depth of water to the area in a given time. Variation in the depth of water applied should not exceed 20%, to any part of the area, and any one part should not receive 15% more than other parts. Increasing the space between sprinklers is not a solution to an uneven coverage.

Losses in water pressure result from friction in mainlines, laterals, risers, and elevation

changes. For a reasonably uniform distribution of water, pressure losses in lateral lines should not be more than 20% below the operating pressure. Total friction losses in both the mainlines and laterals should not exceed 25-30% of the operating pressure.

Many systems are sold in which 20 to 30 psi. pressure is lost in some mainlines. This happens when smaller sized pipe is used. Furthermore, even though a larger power unit may increase the pressure, the friction losses increase operating costs. In summation, ASAE standards should be strictly adhered to in allowable friction losses.

Sprinkler Spacings

Medium-pressure sprinkler nozzles should be spaced at intervals not greater than one-half the distance of their effective diameter if wind conditions are normal. Sprinklers spaced 70%

(Continued on page 38)

Table 2. Approximate available moisture capacity of some typical Florida soils.

Soil Type	In. Water per 1 ft. Depth	In. Water per 2 ft. Depth	Amount Water to Apply Each Irrig.*
Ridge Soils:			
Lakewood fine sand	0.35	0.70	0.47 inch
Blanton fine sand	0.40	0.80	0.52 inch
Lakeland fine sand	0.50	1.00	0.65 inch
Ft. Meade fine sand	0.70	1.40	0.93 inch
Orlando fine sand	0.80	1.60	1.05 inch
Flatwood Soils:			
Pomello fine sand	0.2	0.40	0.27 inch
Adamsville fine sand	0.5	1.00	0.67 inch
Pompano fine sand	0.6	1.20	0.80 inch
Immokalee fine sand	0.7	1.40	0.93 inch
Scranton fine sand	0.7	1.40	0.93 inch
Leon fine sand	0.8	1.60	1.05 inch

*includes evaporation losses, at 75% efficiency.

How WATER Affects Plant Life

By S. R. WEST

Plant Physiologist

Crops Research Division, Agricultural Research Service
U. S. Department of Agriculture, Florida Agricultural Experiment Station
Gainesville, Florida

PLANT GROWTH and other biological systems are only possible because water possesses the most unusual combination of properties of any known liquid. Environmental extremes are tempered and reduced by these properties. Evaporation produces a strong cooling effect, and its condensation from vapor has a warming effect. It is a good conductor of heat, and thus water distributes heat received on a plant's surface rapidly throughout the plant itself. This conductivity also enables heat to be readily passed from inside the plant to its surfaces to help reduce damage during short periods of low temperatures.

The high density, high surface tension, and high tensile strength of water allow it to withstand the suction forces that pull it to the tops of plants. Water ad-

heres firmly to plant surfaces, and its tendency to be absorbed explains why there are large amounts of water in cell walls and protoplasm; why they swell when they take in water.

Since it is a poor conductor of electricity, water is an excellent solvent for electrolytes, which can ionize freely. Another desirable property, of significance to green plants, is the high transparency of water that permits light and other forms of radiation to penetrate even thick leaves. But, because water is not transparent to infrared light, it traps heat inside the plant.

Uses Of Water In Plants

Because of its unique combination of properties, water is an essential factor to the very existence of life on earth. Water has the most unusual combina-

tion of functions of any substance found in plants. These functions can be listed under four general headings.

As a constituent. Water, an essential constituent of active protoplasm, often makes up 80-90% of the fresh weight of grass plants. A decrease in water content much below normal is accompanied by a decrease in rates of various physiological processes. If the water content falls below a certain critical value, death from dehydration occurs. A few plants can be dehydrated to air dryness without being killed, but most of our grasses do not fall into this category. Even when the water content is reduced to a low level by such treatment, physiological activity also is reduced to a low level. Water, therefore, is a very important constituent of protoplasm.

As a reagent in plant use. Various physiological processes in plants depend upon water as a reactant, including photosynthesis, the conversion of starch to sugar, and the breakdown of protein to amino acids. An important reagent in all of the ester formations that take place in plants, it is essential for many of the energy transfer reactions. Water can react with all kinds of compounds because of its unique chemical properties.

As a solvent. Water is perhaps the most universal solvent known. Even most gases are readily soluble in water. Thus, oxygen and carbon dioxide can readily pass from cell to cell within a plant. Vacuoles, or large central cavities in older cells filled with a water solution of many components, serve as a sump for toxins and other excess

materials because of the great range of solubilities in water. Cells are joined together by water and permit transfer of soluble materials from one cell to another and from one organ to another. Many important substances such as sugars, organic acids, phosphates, and nitrates are soluble (if hydrogen bonding is possible) and therefore transferred.

For maintenance of turgor. Another role of water is to maintain turgor, essential to leaf form, new shoots, stems, and other plant structures. Water and turgor are essential to the opening of stomata (gas and vapor exchange pores) and movements of leaves, flower parts, and other plant structures controlled by changes in turgor. The most evident effect of an internal water shortage is a reduction in vegetative growth, because maintenance of a sufficiently high water content for a certain minimum turgor seems essential for cell enlargement.

Amount Of Water Used

Although plants actually use less than 5% of the water that passes through them, the total volume they take up appears to be necessary. The State Climatologist of the U. S. Weather Bureau of Gainesville, Florida, calculated that evapotranspiration of water from grass sod could be as high as 40 inches in a 12-month period. Thus, turf uses 3½ feet of water each year. Due to poor water-holding capacity of many Florida soils, poor distribution of rainfall, and too high use of water, deficits of water develop in our grasses, loss of turgidity occurs, numerous plant processes are impaired,

growth is reduced or ceases, and death from desiccation finally results.

Survey Of The Problem

The best hope of relief would seem to be through the development or introduction of grasses that are better able to withstand the stress of drought. With this motivation, we have been attempting to locate and describe the metabolic processes in a grass plant that are affected by water stress. This information will provide plant breeders with specific selection criteria, so that their work can be greatly concentrated and a solution to the problem made more expeditious.

Research reported in the literature indicates that a variety of factors increase drought resistance. These include efficient root systems, thick cutin, and stomata that close promptly when water deficits develop. These characteristics serve to postpone the damage caused by drought; but the final test involves the ability of the living cell to endure critical water stress.

If we accept that cells are the fundamental units of which all living organisms are made, it may be assumed that the response of a plant to stress will be reflected by the effect of treatment on cellular processes. Cells grow as a result of the satisfactory completion of thousands of chemical reactions. Most of these reactions are mediated by enzymes which are made, to a large extent, from protein. Thus the expression of heredity or nuclear information must necessarily depend upon the proper synthesis of these proteins.

Proteins are giant molecules consisting of chains built from about 20 different kinds of amino acids or building blocks. Thousands of different proteins go into the makeup of one living cell. Those proteins perform thousands of different acts in the precise sequence that causes the cell to live. Each protein appears to be designed with high specificity for its particular task. The features of this design of proteins are the number and exact sequence of the amino acids that make up the large molecule.

The main task and function of genetic information is to provide that all of those proteins, that do the work of the cell, get synthesized in good order at the proper time. Genetic information of the cell which constitutes these instructions is embodied in another large molecule, deoxyribonucleic acid (DNA). DNA is largely confined to the nucleus and makes up a large portion of chromosomes. Protein synthesis takes place outside of the nucleus in the cytoplasm of the cell. Therefore, DNA does not take part directly in the aligning of amino acids to make proteins. Instead, the genetic code in the long double-chain molecule of DNA is transcribed into shorter single chains of ribonucleic acid (RNA) which carry away the information needed to construct one kind of protein. Because these molecules of RNA carry the genetic information, they are called messenger RNA (mRNA). Current dogma which is supported by data suggests that mRNA is made in the nucleus on DNA. The final joining of amino acids to make protein takes place on ribosomes which

are found in the cytoplasm. These ribosome particles, visible only with the electron microscope, contain a large fraction of RNA.

Protein Synthesis Studied

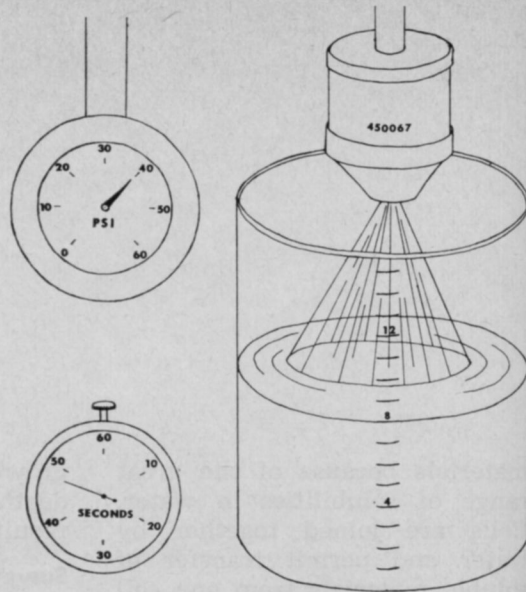
In our search for the key to what the stress of lack of water may be doing to limit growth, we looked first at protein synthesis. We found that when water stress reduced protein by 40%, growth was reduced twice that amount or 80%. Contrary to what may have been expected, total RNA increased by 30% in the same water-stress treatment. More surprising still, the increase in RNA appeared in the ribosome fraction. This meant more machinery was present for making protein, yet less was made.

Subsequent tests revealed that the information from the nucleus was being drastically altered by the water stress. We do not yet know whether messenger RNA is still being made as a result of the drought conditions, or whether the message that is synthesized does not contain the correct information. At any rate, we have determined that water stress prevents mRNA from functioning in protein synthesis. We are now trying to determine the nature of the effect of drought on this very important fraction of RNA. Then we will be searching for plant materials whose mRNAs are not susceptible to water stress, or for ways of inducing resistance in our fabricated, drought-tolerant grass.

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Are Worn Nozzles Stealing Your Spray Chemicals?



Worn and uncalibrated boom sprayer nozzles are important causes of wasted chemical on large-scale, blanket spray jobs. Holes in nozzles become larger from wear caused by impurities and abrasives in chemical sprays and water.

To determine the actual discharge of a spray nozzle, regulate the pump at 40 pounds per square inch (PSI), and catch the discharge of one nozzle in a measuring container for one minute. Use a container measured in ounces.

Check the number of the spray nozzle. Count three decimal places from the left; this will be the original discharge rate of the nozzle hole at 40 PSI. If, for example, the number is 8002, nozzle discharge should be 0.2 gallons per minute (GPM). If the number is 800067, the output from that nozzle should be .067 GPM.

Note the amount of liquid collected in the measuring container. When the nozzle output is supposed to be 0.2 GPM, 25.6 ounces should be collected. If .067 GPM is the nozzle-output rating, 8.5 ounces should be collected in one minute.

Ounces are converted to gallons by using the following formula:

$$\frac{128 \text{ oz.}}{1 \text{ gal.}} = \frac{(\text{Ounces collected in one min.})}{(\text{Gallons discharged in one min., GPM})}$$

If 8.5 oz. are collected, 8.5 replaces "(Ounces collected in one min.)" in the formula. To find "(Gallons discharged in one min., GPM)", cross-multiply.

$$\frac{128 \text{ oz.}}{1 \text{ gal.}} = \frac{8.5 \text{ oz.}}{(\text{Gallons discharged in one min., GPM})}$$

$$1 \text{ gal.} \times 8.5 \text{ oz.} = 128 \text{ oz.} \times (\text{GPM})$$

To find GPM, multiply 1 gal. by 8.5 oz. to get 8.5. Now divide by 128 and the answer is .067, showing that the nozzle is giving out the rated number of gallons it was originally calibrated to put out. However, if the nozzle number rating is less, .055 GPM for example, then the actual output (8.5 oz. or .067 GPM) is too much, and chemical spray will be wasted.

A nozzle that discharges .067 GPM when it is expected to discharge only .055 GPM wastes more than 1/2 gallon of spray solution in one 8-hour day. Multiply this waste (1/2 gallon) by the number of worn nozzles on a spray rig, 12 for example, and a total of 6 gallons of spray would be wasted each day.

Increased discharge by worn nozzles can be remedied in two ways. Either replace worn nozzle parts, or reduce the number of nozzles on the spray boom so the total discharge from all nozzles will not exceed recommended dosage rates.

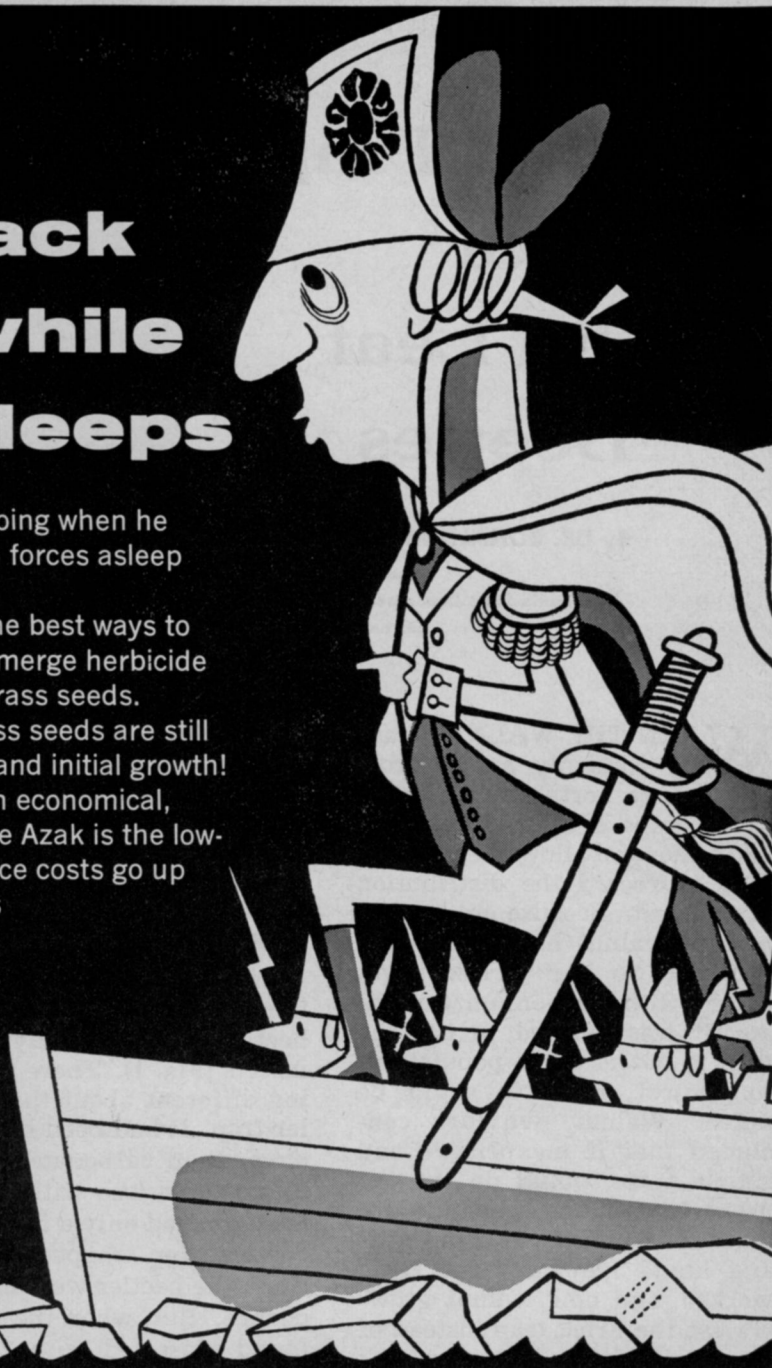
That's right, General, attack with AZAK® while the enemy sleeps

General Washington knew what he was doing when he crossed the Delaware to catch the British forces asleep at Trenton.

And, turf managers know that one of the best ways to get rid of crabgrass is to use Azak® pre-emerge herbicide before warm weather awakens the crabgrass seeds. Applied to established turf while crabgrass seeds are still asleep, Azak prevents seed germination and initial growth!

Turf managers also know that to use an economical, one-application, pre-emerge herbicide like Azak is the low-cost way to control crabgrass. Maintenance costs go up when control starts after the crabgrass is up and damaging good turf.

Azak has other important benefits, too. It is safe for most established lawn and other ornamental turfgrass at the recommended rate. It is odorless and is used as a wettable powder or as a granular product. Azak is compatible with other pesticides and fertilizers, thus can be applied alone or in mixes. It is low in toxicity to warm-blooded animals.



USING NITROFORM® CAN CUT COSTS, TOO

Turf managers also know that by using Nitroform, Hercules ureaform (38-0-0), they can put on enough nonburning, long-lasting turf food at one time to cut the number of fertilizer applications. Nitroform nitrogen is released slowly in contrast to low-analysis, quick-acting fertilizers. With fewer applications required, storage space is saved and maintenance crews are released for other work. These advantages keep overall maintenance costs down. Nitroform is odorless and resists leaching. Available in two forms: Blue Chip® for mechanical spreaders and Powder Blue*, the first ureaform for spray application.



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STH66-3

Simple Trap for Elm Leaf Beetles

By DR. RONALD M. HAWTHORNE

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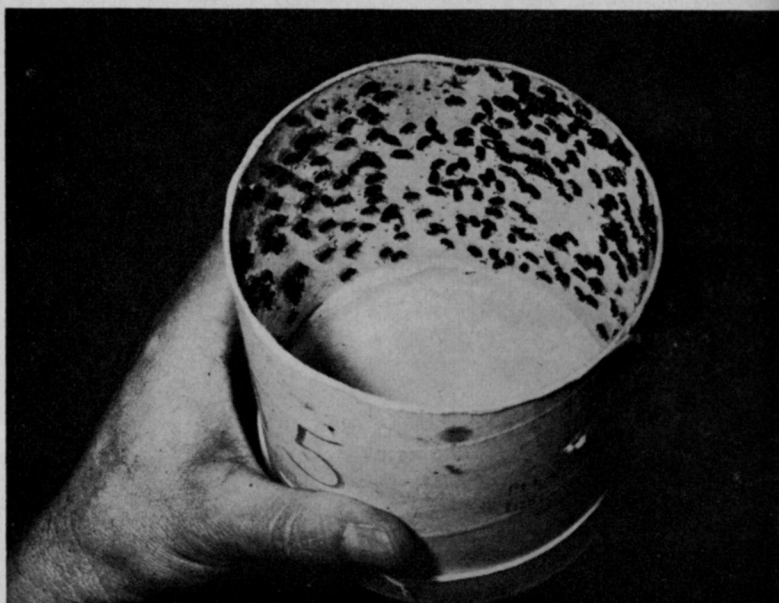


Fig. 1. Elm leaf beetles literally coated this Frick trap which was hung in an apple tree near an elm tree. Almost all of the insects in this trap were elm leaf beetles, more than 250 by actual count. The trap was baited with ammonium carbonate.

WHEN THE WALNUT husk fly suddenly moved from southern to northern California, Frick traps (Fig. 2) picked up adult flies and allowed entomologists to record the distribution of this pest. Because great numbers of walnut husk flies were attracted to the Frick traps, baited with ammonium carbonate, it was decided to use the trap to detect early populations so control measures could be taken. Walnut growers concluded that if inexpensive and simple traps would do the job properly, the traps would eliminate the necessity of using pans and liquid lye bait. The traps worked, and now walnut growers use the Frick trap instead of lye pans to detect incoming husk flies.

When the "all-purpose" Frick traps were removed from California cotton fields, where they were being tested for pink boll-

worm detection, they were placed in fields nearby and checked by County Agriculture Departments. Many interesting insects were found in them.

Elm Leaf Beetles Plaster Trap

One rather outstanding collection contained over 250 elm leaf beetles, but practically no other insects (Fig. 1). There was nothing different about this particular trap. It had been baited with ammonium carbonate and hung in an apple tree with elm trees nearby. Had only a few elm leaf beetles been trapped, we might think the beetles were caught by chance. But, when the trap was found plastered with 250 adult beetles, it was apparent that ammonium carbonate is strongly attractive to some species of beetles as well as to flies.

The trap was invented quite a

few years ago by a young entomologist, Dr. Kenneth Frick of the Washington State Department of Agriculture. He was working with cherry fruit flies and needed a trap to sample and detect the populations. After many trials with carton-type traps, he came up with a dry-baited, sticky-sided trap that worked, the Frick trap.

Dr. Frick lined the insides of one-quart freezer cartons with his own special "stickum" and added powdered ammonium carbonate. After the eradication of cherry fruit flies in California, Frick's traps were used as "all-purpose" traps for detection of other flies. Since powdered ammonium carbonate is an attractant for many fruit fly species, its use in the Frick trap was continued.

What adaptations the versatile Frick trap may undergo in the future cannot be predicted. It is only an inexpensive pasteboard freezer carton, with the inside smeared with "stickum," baited with an attractive lure such as ammonium carbonate, and suspended by a string preferably in a host plant. The powdered bait is placed in the carton lid, then the perforated trap bottom is pushed into the lid to hold the lure. The Frick trap seems to have definite possibilities as an effective tool for pest detection.

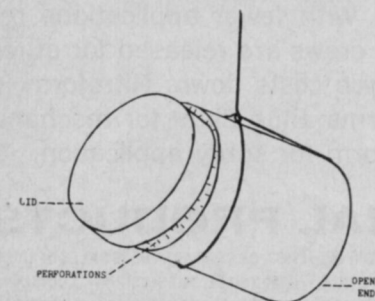


Fig. 2. Frick traps are made of pasteboard freezer cartons lined with a pasty "stickum" to catch insects. They are hung in host trees in filtered shade, preferably with foliage in front or slightly below, but never touching, the open end. Traps hang horizontally with the open end tipped downward to prevent moisture accumulation. An attractant, powdered ammonium sulfate, is placed in the lid, and then the perforated bottom of the carton is pushed into the lid to secure the bait.

Ho-hum... another new herbicide...

This one is called Phytar 560! You'd think that manufacturers would run out of funny names . . . or would get wise to the fact that farmers are completely confused about all the new herbicides kicking around these days.

But we think you'll remember PHYTAR! It does things that none of the others have been able to do. It's a general, non-selective herbicide that completely eradicates all vegetation along roadways and ditches, around buildings and storage areas and in other non-crop areas. If you've been using weed oil to

do these jobs you'll find PHYTAR vastly superior in at least five important ways: (1) It's more effective and *cheaper*; (2) There is absolutely no residual toxicity, (3) no staining, and (4) not nearly as much corrosion of your spraying equipment. (5) You'll eliminate the storage problem because one gallon of PHYTAR 560 (which is mixed with water when you're ready to apply it) is equivalent to 50 gallons of weed oil.

Try it! The name's PHYTAR . . . and it's a product of the Ansul Company, Marinette, Wisconsin.



THE ANSUL COMPANY, MARINETTE, WISCONSIN

RECENTLY, a new herbicide was introduced that offers a solution to many of the vegetation control problems encountered by custom applicators. Technically, this herbicide is 4-amino-3, 5, 6-trichloropicolinic acid, and is known by the Dow Chemical Company trade name as Tordon.

It is a highly active systemic compound, effective on a wide range of broadleaved plant species. Sprays applied to the foliage of plants in the conventional manner produce growth responses similar to those from 2,4-D and 2,4,5-T. Initial reactions of the plant include curling of the leaves and twisted new growth. This is followed by gradual death quite similar to the effect produced by phenoxy herbicides. Most broadleaved plants are killed, while most grasses are not normally affected at application rates usually recommended for weed control.

Has High Safety Factor

Tordon is effective for the control of broadleaved weeds and woody brush and has a high safety factor in relation

to man and animals. It has a low acute oral toxicity, with an LD₅₀ value for white rats of 8.2 grams per kg. of body weight. Feeding tests with chickens, Japanese quail, swine, calves, and sheep show no problems stemming from accidental ingestion of the material. Experiments have been conducted to evaluate the effect of the herbicide on fish and other aquatic organisms, and here again, it displayed relatively low toxicity. No adverse effect on rats and dogs and no measurable histopathological tissue changes were indicated by 2-year feeding tests.

Kills Conifers

Initial leaf kill and brown-out are not as uniform nor as rapid on some species of brush sprayed with Tordon 101 Mixture as with sprays of 2,4,5-T and 2,4-D. Coniferous species, however, which are not effectively controlled by these herbicides, can be controlled readily with the 101 mixture. Leaf-stem sprays with the mixture have given excellent control of many of the most common woody plants, such as black locust, sassafras, per-

simmon, and hickory. The maple species are especially susceptible.

Tordon 101 Mixture should be applied to brush in the growing period from full leaf development in the spring until about three weeks before frost in the fall. As with other herbicides, growing conditions affect the results that can be expected. When applications are made to plants under stress because of lack of moisture, maximum results may not be obtained.

Experienced spray crews can apply the mixture safely and effectively to get the best results, with maximum protection to desirable vegetation nearby. Application by experienced crews working from hose lines with adjustable spray guns has been very effective; however, other methods of application are being evaluated.

At the present time, Tordon 101 Mixture containing a combination of 2,4-D and Tordon herbicides is recommended for the control of a broad range of woody plant species growing on industrial sites. This mixture is recommended at rates of 1 to 3

Tordon...

a new vegetation management tool

By DR. MARK G. WILTSE

Plant Science Research and Development

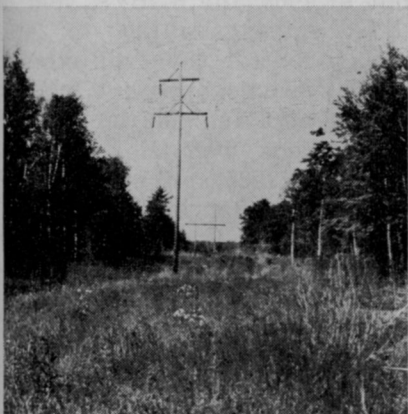
Bioproducts Department

The Dow Chemical Company

Midland, Michigan



For unwanted woody plant control, Tordon 101 is best applied to brush between spring leaf development and 3 weeks after fall frost.



Control of regrowth is shown above where area ground cover has no brush after being treated with Tordon mixture along this right of way.



Combined with a particulating agent, Tordon can be used in aerial applications such as this, making it applicable for brush control along hard-to-get-at powerlines in difficult areas.

gallons per 100 gallons of water to be applied as a leaf-stem spray so as to thoroughly wet the root collar, stems and foliage of the brush. On some of the more resistant species, such as live oak and some species of ash, soil over the root area of the brush should also be sprayed to enhance total effect through root uptake.

Rainfall Aids Pellets

A dry formulation, Tordon 10K Pellets, can be applied to the soil for brush control. The pellets can be distributed easily with granular applicators or spread by hand over the root areas of plants to be killed. Applications have been effective any time there is no frost in the ground. Rainfall after application aids in leaching the herbicide into the root zone of woody plants. These pellets are particularly useful for spot treatment brush control or in areas where the use of spray equip-

ment is uneconomical or hazardous. Treatments can be made early in the spring during periods of time when equipment and manpower are not used. A rate of 60 lbs. of Tordon 10K Pellets per acre has given control of such species as maple, conifers, locust, aspen and wild rose, while rates up to 85 lbs. per acre may be required for the control of black gum, oak and ash. For the control of a mixed stand of brush, a rate of 75 lbs. per acre of the pellets is recommended.

For effective spot applications, the pellets should be distributed evenly over the soil above the entire root system, from the stem outward to 1 ft. beyond the branch tips (drip line). For this type of application, Tordon 10K Pellets should be applied at 1 to 2 tablespoonfuls per 30 sq. ft. of soil surface. On sandy soils, or other soils easily leached, applications should be applied just prior to bud break in the spring,

and higher rates of application should be used.

Most deep-rooted perennial weeds including field bindweed, Canada thistle, Russian knapweed, leafy spurge, bur ragweed, milkweeds, docks, larkspur, toadflax, horse nettle, and poverty weed have been controlled very effectively by Tordon sprays. Application can be made at any time after the ground thaws in the spring until freeze-up in the fall.

Because of the degree and range of effectiveness of this herbicide, care during application is a necessity. Where roots of desirable plants are exposed to treatment, this herbicide can cause serious injury or actually kill the plants. Small amounts of drifting spray can also damage desirable broadleaved plants. It is important that crews applying Tordon be trained in the correct practices for the handling and use of herbicide materials.

Preemergence Siduron Controls Crabgrass Safely in Four Turfgrasses

By
W. M. LEWIS
and
W. B. GILBERT

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CRABGRASS and goosegrass are two weed pests that cause serious problems during the months of turf establishment in the spring. Previous studies have shown that most preemergence crabgrass herbicides are toxic to turfgrasses when applied at seeding time or within a few weeks after emergence.

Preliminary studies have shown that siduron¹ controlled crabgrass in bentgrass, Kentucky bluegrass, Merion bluegrass, red-top fescue, and Pennlawn red fescue when applied at seeding time without affecting germination.

In North Carolina, two tests were conducted to determine the effects of siduron on crabgrass and goosegrass, and also its effects on the establishment of several warm- and cool-season turfgrasses. One test was conducted in 1964 and another in 1965.

Test plots were set up in an area heavily infested with crabgrass at Raleigh, North Carolina; soil type is Cecil clay loam. Test rates of siduron were applied in 4-foot bands across triple-replicated strips of turfgrasses 3 feet wide. The five warm-season grasses tested were common bermudagrass, Tifton 328 bermudagrass, carpetgrass, centipede grass, and Meyer zoysia. Three cool-season grasses were Merion bluegrass, Kentucky 31 tall fescue, and Pennlawn red fescue.

All eight grasses were plotted in the 1964 tests. Tifton 328 and Meyer zoysia were sprigged, and the other grasses seeded, on May 8, 1964. However, only the six seeded turfgrasses were planted in the 1965 plots, on April 16. Seedbeds were prepared by till-

ing in 8-8-8 fertilizer at the rate of 25 lbs./A. In mid-June after planting, additional 16-8-8 fertilizer was applied at 10 lbs./1,000 sq. ft. Plots were irrigated as needed during a three-week period after planting.

Siduron was applied immediately after planting (with a second treatment in some cases one month later). Rates in terms of pounds active ingredient per acre were 4, 6, 2+(4), 8, and 4+(4).

In September of each year, 1964 and 1965, the percent crabgrass control and goosegrass control was determined (Table 1). The number of each weed species in a random square foot sample in each plot was counted. This number was converted to percent on the basis of the number of weeds in untreated check plots. Turfgrass stand establishment was based on visual ratings

which were converted to percent values based on untreated check plot stands.

Crabgrass Controlled

All rates of siduron gave excellent crabgrass control in 1964; but in 1965, the 6 lb./A. and 8 lb./A. rates gave 12% to 24% better control than all others. There was no apparent advantage to applying siduron in split applications over single treatments. In 1965, split applications gave somewhat less control of crabgrass.

None of the rates of siduron treatments controlled goosegrass adequately. The 8 lb./A. rate gave only 49% control in 1964, and 60% control in 1965 tests. In 1965, only the 4 lb./A. and 8 lb./A. rates were significantly different from the check plots.

Siduron Retards Four of Eight Grasses

Turfgrass stand establishment was determined on October 21, 1965, for both 1964 (Table 2) and 1965 (Table 3) tests. Results were based on visual ratings, and for ease of comparison, all data were calculated as percent of check plot turf establishment.

In both years, many siduron-

Table 1. Percent crabgrass control and goosegrass control from pre-emergence siduron treatments.

Siduron rates lbs./A. (a.i.)	% Crabgrass Control		% Goosegrass Control	
	Sept. 4, '64 17 wks. after treatment	Sept. 18, '65 22 wks. after treatment	Sept. 4, '64 17 wks. after treatment	Sept. 18, '65 22 wks. after treatment
4	98 a ¹	68 a	61 a	52 ab
6	93 a	92 a	43 a	18 bc
2+(4)*	95 a	80 a	45 a	18 bc
8	99 a	92 a	49 a	60 a
4+(4)*	99 a	75 a	69 a	28 abc
Check	0 b	0 b	0 b	0 c
Plants/sq. ft. in check	94	28	28	36

*Second application of 4 lbs./A. made approximately one month after the first application.
¹Numbers followed by the same letter are not significantly different at the 5% level of probability, according to Duncan's Multiple Range Test.

¹Siduron is technically called 1-(2-methyl-3-cyclohexyl)-3-phenylurea. DuPont's trade name for the herbicide is Tupersan.



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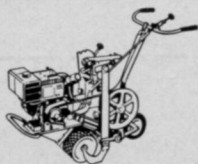
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Table 2. Average stand (%) of five warm-season (WS) and three cool-season (CS) turfgrasses treated with siduron at the time of establishment. Grasses were planted May 8, 1964 and stands evaluated October 21, 1965.

Turfgrass	Season Type	Percent stand at siduron rates (lbs./A.)				
		4	6	2+ (4)	8	4+ (4)
Carpetgrass	WS	14	36	6	4	0
Centipedegrass	WS	1	7	0	0	0
Common bermudagrass	WS	11	37	15	11	12
Tifton 328 bermudagrass*	WS	113	83	88	67	78
Meyer zoysiagrass*	WS	108	108	108	108	108
Merion bluegrass	CS	482	291	361	194	367
Kentucky 31 tall fescue	CS	567	440	453	383	513
Pennlawn red fescue	CS	433	433	378	322	489

*Planted as sprigs.

treated plots of carpetgrass, centipedegrass, and common bermudagrass did not germinate, or their stands were very sparse. There were 18 subplots of each grass variety. No carpetgrass germinated in 8 plots in each year, 16 centipedegrass plots were bare in 1964 and 17 plots bare in 1965, and common bermudagrass was not found in 5 plots in 1964 nor in 4 plots in 1965. There was apparently no relation between the application rates of siduron and a lack of germination.

Sprigged Tifton 328 bermudagrass was definitely retarded by siduron. Plots did not start to fill in until mid-August of the first year. By the end of the second year, only the plot treated 4 lb./A. had an average stand greater than the check (Table 2, 113%). One subplot at the 8 lb./A. rate, and one at the 4+(4) lb./A. rate, were bare.

Treated Zoysia and Cool-Season Turfs Form Sod Mat

Meyer zoysiagrass, which was sprig-planted, was not affected adversely by any rate of siduron treatment. Plots filled in quickly

during the first year forming a dense sod, and all treated plots had a turf stand greater than their checks (Table 2, 108%). Meyer zoysia was apparently the only warm-season grass tested that can be treated safely at planting time with siduron.

Germination and establishment of the three cool-season grasses were not affected by siduron applications. In fact, average stands were increased as much as 133% to 567% due to siduron's crabgrass killing power.

In summary, siduron at 6 lbs./A. and 8 lbs./A. consistently gave a high degree of preemergence crabgrass control. None of the five siduron treatments, however, gave acceptable goosegrass control. Siduron cannot be safely used at seeding time for weed control in carpetgrass, centipedegrass, or common bermudagrass nor when Tifton 328 bermudagrass is sprig planted. Conversely, sprigged Meyer zoysia was not adversely affected by siduron, and siduron did not affect germination and establishment of the three cool-season grasses, Merion bluegrass, tall fescue, and red fescue.

Table 3. Average stand (%) of three warm-season and three cool-season turfgrasses treated with siduron at time of establishment. Grasses were seeded April 16, 1965 and stands evaluated October 21, 1965.

Turfgrass	Seeding rates (lbs./1,000 sq. ft.)	Percent stand at siduron rates (lbs./A.)				
		4	6	2+ (4)	8	4+ (4)
Carpetgrass	3	24	14	8	10	5
Centipedegrass	3	0	1	0	0	0
Common bermudagrass	1	4	8	6	8	10
Merion bluegrass	4	300	367	167	400	200
Kentucky 31 tall fescue	5	233	183	200	283	183
Pennlawn red fescue	4	200	233	133	233	142

Future Market Potential for Sod Growers

Highlights U. of Md. Meeting Last Month

Sod grass is big business in Maryland and it is a growing business, but it is not a business for everyone, Brian Finger, Montgomery County Extension Agent, cautioned last month. He reported that there are now some 250 Maryland farms that offer cultivated sod for sale.

Speaking to an overflow crowd in the University of Maryland Center of Adult Education, during the March 2nd Maryland Sod Producers Conference, Finger said an acre of high-quality cultivated sod can be marketed for nearly \$3,000, but this is by no means all profit. To begin with, the high cost of land in the metropolitan areas is a limiting factor, but even if land is available, the cash outlay to establish sod is considerable.

He considers the outlook for sod farming in the metropolitan

Washington, D.C., area as bright, but reminded landowners that capital needs can be quite high. He listed expenses of nearly \$1,000 per acre (not including labor and land costs) before quality sod is ready for market.

Potential Outlined

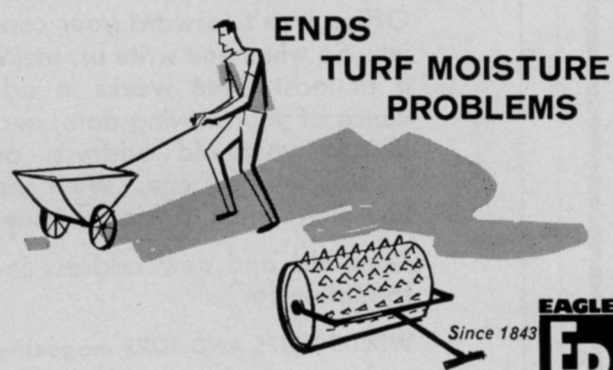
But the market is growing, Finger forecast. Single-family-type dwellings are being built at the rate of 17,000 a year and apartments are going up at the rate of 30,000 units yearly. In Montgomery County alone, he said, it is expected that 40 new schools will be built in the next 20 years; the totals for Prince Georges County may be even higher, and along with most of the new schools go athletic fields. New communities, industrial installations and government agencies are moving to the

suburbs, and parks and golf clubs are coming into being. All these are potential sod customers, he observed. Maryland's 7,000 acres now in commercial sod production will have to increase to meet the demand.

Following up the idea of high-quality sod, Joseph Newcomer, University of Maryland Extension agronomist, reported many of the states bordering Maryland have already enacted sod laws. He said the FreeState emphasis will be on a sod certification program.

Programs under consideration provide that certified sod will be grown from certified seed on a field that has been approved before planting and the sod will have to be inspected before it is sold. According to Newcomer, Maryland "Approved" sod will not have to be grown from certi-

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fied seed, but to be classified as such it will have to be grown from seed approved by the State Board of Agriculture inspectors.

He said he believes this program will assure Maryland producers a fair market for their crop and users will be assured of getting a quality product.

M. Hanford Day, head of Maryland's State Board of Agriculture seed testing laboratory, urged all sod growers to insist on certified seed, but to also read the label to make sure the seed meets the individual standards set by the user. "You should have some minimum specifications, and you should have them written down," he advised. If seed is bought on specification, Day added, payment can be made after a laboratory test shows the seed to be as advertised.

Edward F. Mayne, owner of Mayne Realty Co., Olney, Md., urged the group to adopt a uniform contract for sod sales. He said such a contract should include a description and location of the sod, the price, terms of

payment, and the time of removal of the sod. This type of contract, he added, protects both the producer and user of sod.

The conference was sponsored by the University of Maryland Department of Agronomy and the Cooperative Extension Service. Program coordinators were Brian Finger and Dr. Elwyn Deal, turf specialist at the University.

18-Month Turfgrass Course Begins at MSU in September

A new course, combining four quarters of classroom study and several months of on-the-job training, will provide individuals interested in turf management with technical knowledge and practical skill to more easily step into this fast-expanding industry.

Beginning Sept. 29 at Michigan State University, East Lansing, students will study basic plant science, biochemistry, turfgrass uses, maintenance, and writing and speaking. The second quarter includes plant diseases, principles of turf culture, applied

entomology, landscape drafting, and other subjects.

Two quarters of on-the-job training will extend from March 20, 1967, to September 28, 1967. This will be followed by two more quarters of classroom work to graduation time in March, 1968. To graduate, a student is required to accumulate 65 credits for on-campus study with a "C" average, and 10 credits of placement training.

Admission to this school requires a student be a high school graduate. Graduates of the course will be provided placement service.

Members of the turfgrass industry, associated with public parks, golf courses, highway landscaping, sod farming, athletic fields, and estates, will offer opportunities for on-the-job training.

For complete information, including cost, room and board, interested readers should write to the Short Course Department, Michigan State University, East Lansing, Mich.

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A quarter of a million of them have bought the 13 hp Cub Lo-Boy, for instance. With 42" rotary mower it fine-clips up to 10 acres a day. With 60" mower it handles up to 15.

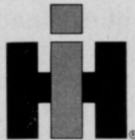
And that's on less than a gallon of gas an hour. The Cub Lo-Boy works with reel mowers, too, of course. Plus dozens of other attachments. It has big model hydraulics and engine-driven power take-off.

Still more compact—and unmatched for working skin-tight to trees, curbs and other obstacles—are the new 7, 10 and 12 hp International Cub Cadet tractors.

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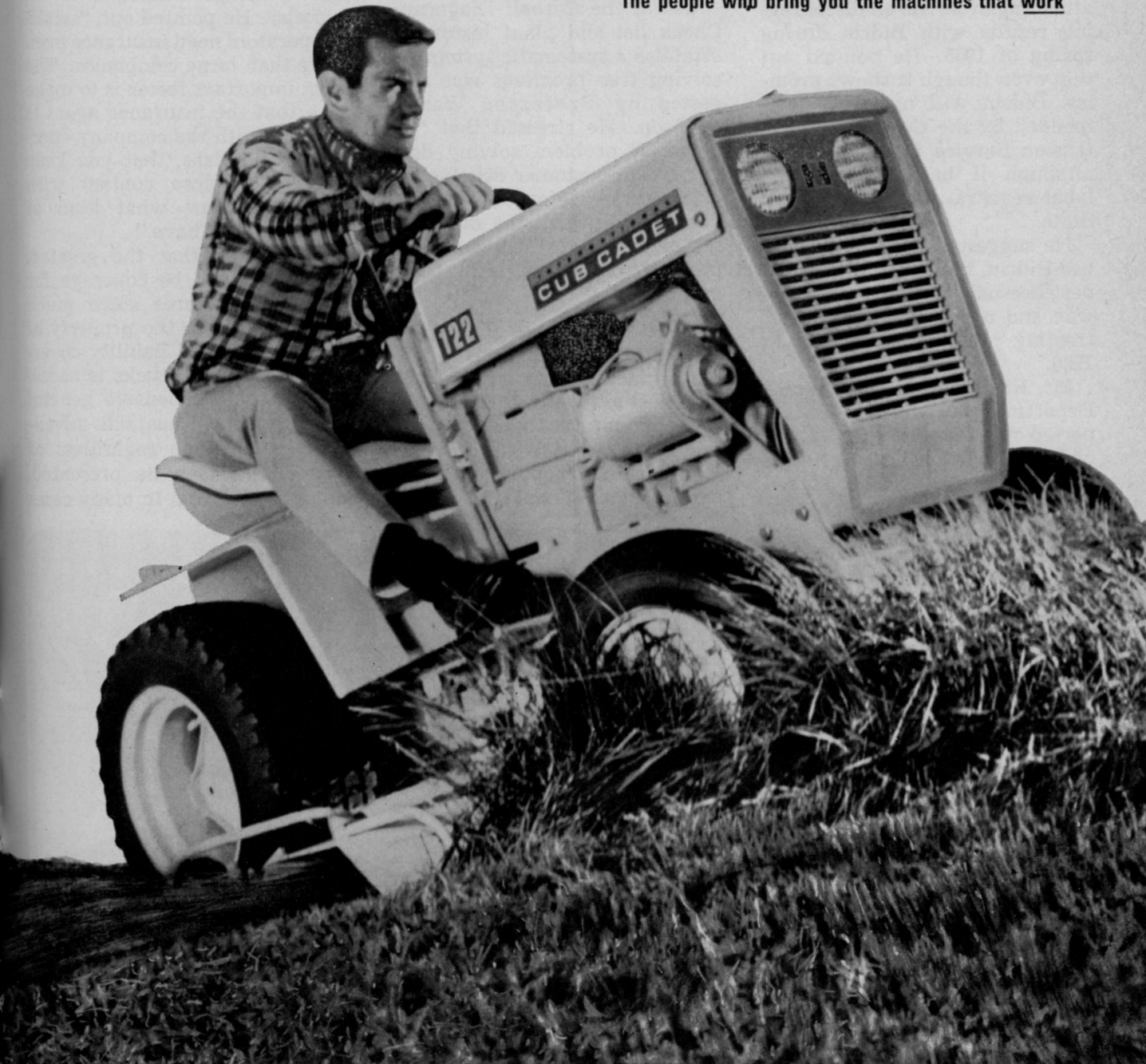
How sturdy? Five-year-old Cadets today are still worth up to 2/3 their original value!

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N. Y. Arborist's Annual Trade Show and Meeting

The annual meeting of the New York State Arborists Assn. was held at the Statler Inn on the campus of Cornell University in Ithaca, this year, utilizing the large judging pavilion where exhibitors had an opportunity to demonstrate chain saws, chip-pers, agricultural chemicals, rope, arborists tools and supplies during an afternoon program. Firms from Connecticut, New Jersey, Ohio, and Wisconsin, as well as New York, were present.

Dutch Elm Disease

Professor John Weidhaas reported to the better than 100 attending arborists on discouraging results with Bidrin during spring of 1965. He pointed out that even though it shows promise, Bidrin will not be recommended by the Cooperative Extension Service for general use although it has been granted label registration in New York State.

He suggested that if arborists use Bidrin, they should gain experience using it on "out-of-the-way and not so valuable trees," treating relatively few trees in 1966.

Mr. Richard Carroll, Forestry Department, Madison, Wis., reported on its success with Vapam or VPM injection for soil sterilization to control D.E.D. spread to adjacent trees through root grafts. He outlined the procedure for injection method on street and lawn trees and indicated that their success to date has been very good. Root grafts in Madison, evidently are a significant vector of D.E.D. "The most serious drawback of such injections appears to be a one-foot-wide strip of dead turf, which can be resodded in 2 to 3 weeks."

Northeast Drought

Professor Wayne Sinclair reported that in the last four years, Ithaca has accumulated a rainfall deficit about equal to a season's water supply; 45% of this deficit has occurred during May,

June and July when trees make most of their growth.

Since this situation is rather typical of the Northeast, Dr. Sinclair related this water deficit to rates of tree growth, showing a rather direct relationship. Thus, he predicted that in 1966 we'll see more canker problems, more incidence of serious root rot organisms, and more frequent inability of declining trees to respond to treatments. He also stressed the importance of irrigating trees liberally during May, June and July.

Horticulture Problem Solving

Use of the Cornell Diagnostic Check list and plant history to establish a systematic system for solving tree problems was suggested by Professor Warren Johnson. He stressed that "hit or miss" problem solving does not create customer satisfaction or success. Before proceeding you should get all the facts and sell a disease or insect control program on a long-term basis, he advised.

Blackbirds & Sex

Blackbird populations (red-wing blackbirds, starlings, and grackles) are controlled to a degree by nature. Man's efforts, said Dr. Oliver Hewitt, to control the blackbird population problem, must be aimed at prevent-

ing successful reproduction rather than allowing merely for a physical reduction in population. Because these birds are prolific and migratory, poisoning and trapping are unsuccessful. He stressed the immense value of filling limited nesting areas with nests full of infertile eggs.

Professor A. M. S. Pridham summarized recent advances in the chemical weed control field, the most striking being the use of activated charcoal to help offset the damaging properties of herbicides to susceptible plants.

Insurance For Arborists

Freeman Parr, Parr and Hanson Inc., Hicksville, talked on the insurance needs, problems, and coverage essential to an arborist. He pointed out, "smaller operators need insurance even more than large companies. The most important factor is to make sure that the insurance agent is familiar with the company operations and risks, that you keep in regular close contact with him and know what kind of coverage you have."

Parr noted that the greatest concern should be coverage for liability exposures since much work is done on the property of others. Potential liability coverage on cars and trucks is necessary. A comprehensive general liability policy has the advantage of coverage regardless of how claims may be presented. He suggested that in many cases



N.Y. State Arborists Assn. officers and directors, elected at recent meet, are (from left) Ira Wickes, Jr., Suffern, N. Y.; Dr. John A. Weidhaas, Jr., Ithaca; Walter Sturmer, Yorktown Heights; Lawrence J. Borger, Bayside; Edward Johnson, Hicksville; 1966 President Professor Daniel Dowd, Farmingdale; Peter Bartholomew, Lockport; past President Authur Sandstrom, Jordan; George H. Callaway, Argyle; Frederick R. Micha, Rochester; Fred Donovan, Mechanicville; and Dr. A. M. S. Pridham, Ithaca.

it is advantageous to get the insurance agent to use the word "occurrence" rather than "accident" on policies. Also, pay attention to non-ownership automobile insurance, property damage insurance, and insist on a hold-harmless contractual liability clause when subcontractors are involved, he said. A contract equipment floater covers movable property which is used away from the insured's premises.

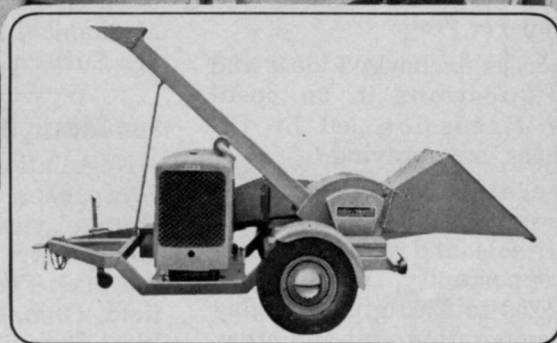
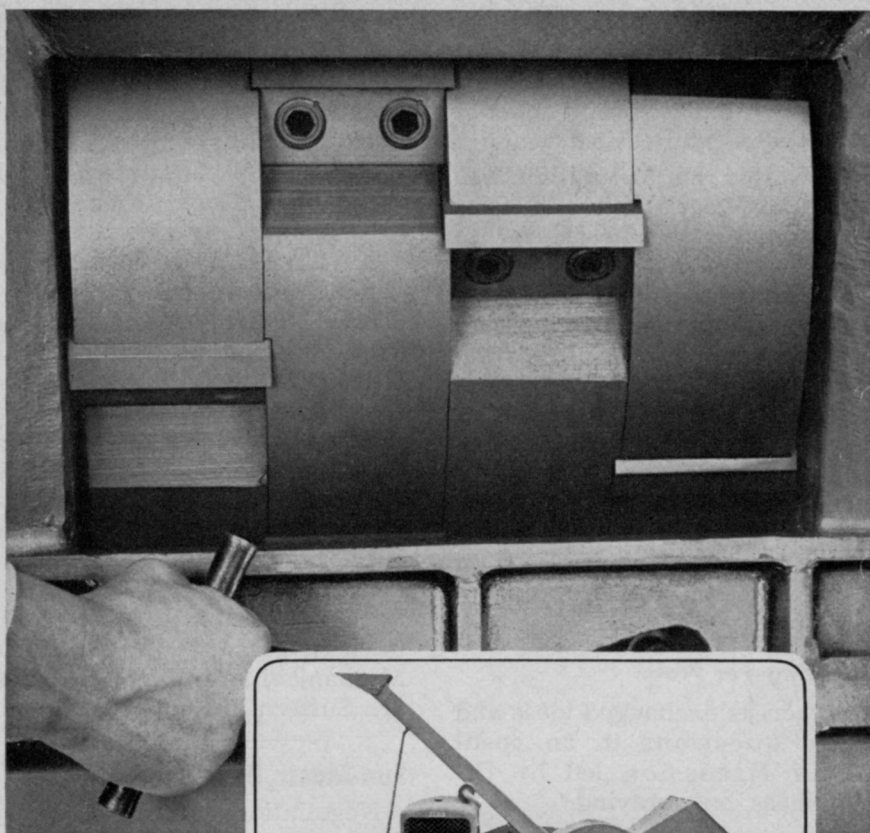
A minimum of 3-5 hundred thousand dollars coverage should be carried by arborists. Many use policies designed for logging and lumbering. However, these policies do not apply if trees are classified as diseased, Parr warned.

The One-Man Tree Business

George Callaway, Llenroc Tree Experts, Argyle, presented his views of the one-man tree business. "The small businessman often attempts to impress people that he is a 'big operator'." Callaway noted that people have the idea they get better service from the small operator who can maintain a close tie of personal service with his client. Less misunderstanding results and decision making in troubleshooting is made on the spot.

One of the most important aspects of a one-man operation is the misleading idea that many jobs can be done at less cost by the owner-operator. Callaway emphasized that it is much more costly in time to attempt repair and maintenance of equipment, clerical and stenographic work, and other odd jobs than to have skilled tradesmen do the work. This, along with telephone answering service, permit the owner to spend more time on selling and public relations. Callaway stressed the need for adequate and effective advertising, particularly in competition with larger companies. He insisted on the need for speaking well of other arborists, advancing the industry, seeking standards of practice and performance to give clientele a uniform image of arborists' performance.

John Ryan, head of New York's Highway Landscape Depart-



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ment, said, "Beautification is not new in New York; some \$7 million was spent last year on landscaping. Four thousand acres of grass were planted last year."

He stated that \$2.1 million was spent last year to pick up litter along highways. In answer to several questions, Mr. Ryan noted that removal of dead trees is included in maintenance and is not part of the beautification program, and also that tree maintenance is included in state work under landscaping. He stated, "The state does not employ a professional arborist, but many of our men are knowledgeable about trees and seek advice from Cornell and the Extension Service."

Spraying For Profit

Arborists exchanged ideas and asked questions in an open-forum discussion led by Dr. Weidhaas on spraying.

Several arborists indicated that liquid feeding of trees was a profitable and effective business opportunity, resulting in from \$250 to \$300 gross per day for one operating unit and crew. A number of arborists were interested in the effectiveness and advisability of using dormant oils. Dr. Weidhaas felt that 60-second viscosity oils had not been proven as yet in research for the diverse and stubborn scale insects found on shade trees, since the 60-second oil has been developed primarily for mites on fruit trees. He thought 70-second oils with high paraffinicity and a high unsulfonated residue percentage would be effective, but cautioned against selling this as an all-purpose, preventive spray. Many insect pest sprays which must be applied during the growing season are harder to sell if a client has been reassured by a general dormant protective treatment.

Licensing Legislation

The arborists' legislative committee reported that efforts are continuing to get an arborists' license bill passed in New York. A great deal of progress has been made since the move was initiated nearly 9 years ago. Many

factors including the interest in beautification, tree preservation, and proper use of agricultural chemicals are underlining the need for protecting the public interest and ensuring high standards of performance by arboricultural workers.

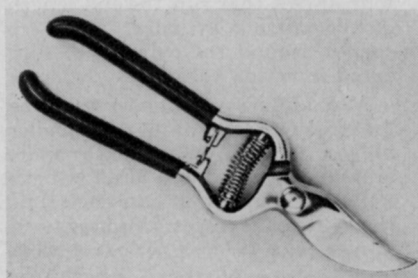
New officers elected at the Ithaca meeting are: President—Daniel Dowd, Farmingdale, L.I.; Vice Presidents—Lawrence J. Borger, Bayside; Edward Johnson, Hicksville; Carl Lundborg, Westbury; Secretary-Treasurer—George Callaway, Argyle; Directors—William R. Herrmann, Syracuse; Frederick R. Micha, Rochester; Arthur C. Sandstrom, Jordan; Peter Bartholomew, Lockport; Walter Sturmer, Yorktown Heights; Fred W. Donovan, Mechanicville; and Ira F. Wickes, Jr., Suffern.

Sun-Mastr Buys Ideal Mower

Negotiations were recently completed between Robert Crump, vice president, Sun-Mastr Corp., Olathe, Kans., and the Mast-Foos Mfg. Co., Springfield, Ohio, for the purchase of Ideal Power Lawn Mower Co.

Ideal has manufactured mowers for over 50 years, with its primary product being a heavy-duty gang lawn mower for use on golf courses, parks, airports, and highways.

Production of Ideal mowers is being transferred to the Sun-Mastr plant in Olathe. Moving of machinery, equipment, and establishing the Sun-Mastr Ideal division will take from 30 to 60 days.



A new, lightweight, professional-type pruner is being offered on the market by Seymour Smith & Son, Inc. Drop forged, with hardened, tempered and precision-ground blade that is extra thin and clean cutting, the pruner has nonslip vinyl grips. Other features: hook-type catch, heavy-duty spring, triple plated and highly polished. More details on No. 128 Pruner from the company at Oakville, Conn. 06779.

Int'l Tree Conference In Cleveland, Aug. 28-Sept. 2

Plans for the 42nd International Shade Tree Conference will include field trips to the many unusual tree plantings and reserves in the host city, Cleveland, Ohio, which is known as the "Forest City." Word from general conference chairman, John G. Milchalko is that there will also be an unusual tree-planting ceremony in the heart of Cleveland's metropolitan area.

Total attendance is expected to be well over 2,000 for the August 28-September 2 meeting to be held in the Sheraton Cleveland Hotel. Arborists from all over the world will gather for the educational conference which also includes an active program for the entire family.

Further information on program plans will be available from John G. Milchalko, Division of Shade Trees, City of Cleveland, 750 E. 88th St., Cleveland, O. 44108, or from Dr. L. C. Chadwick, ISTC Executive Secretary, 1827 Neil Ave., Columbus, O. 43210.

Oregon Adds Two Ryegrass Varieties for Certification

Two new ryegrasses, Magnolia, from Mississippi, and Florida Rust Resistant Ryegrass, from Florida, have been added by the Oregon Ryegrass Growers Seed Commission to its list of certified seeds.

Research at experiment stations in Mississippi and at the University of Florida have yielded these two new varieties of ryegrass which are highly resistant to crown and leaf rust.

Florida Rust Resistant Ryegrass has notable uniformity when in full head and is a good seed producer. Magnolia also proved to be superior to domestic and Gulf ryegrass in forage production and seed yields.

For additional information, interested readers may write to Jack L. Blair, Administrator, Oregon Ryegrass Growers Seed Commission, P.O. Box 247, Albany, Oregon 97321.

Suppliers Personnel Changes

Amchem Products, Inc., recently assigned G. Watson Whiteside as a sales representative for the Lawn and Garden Products Department. He will serve Wisconsin and Illinois.

The Ansul Co. announces appointment of Nick Mechales as sales representative in the Chicago area, and Eldon L. Hyde as agricultural sales representative in the states of Kansas, Missouri, Iowa, Nebraska, the Dakotas, Minnesota, and Wisconsin.

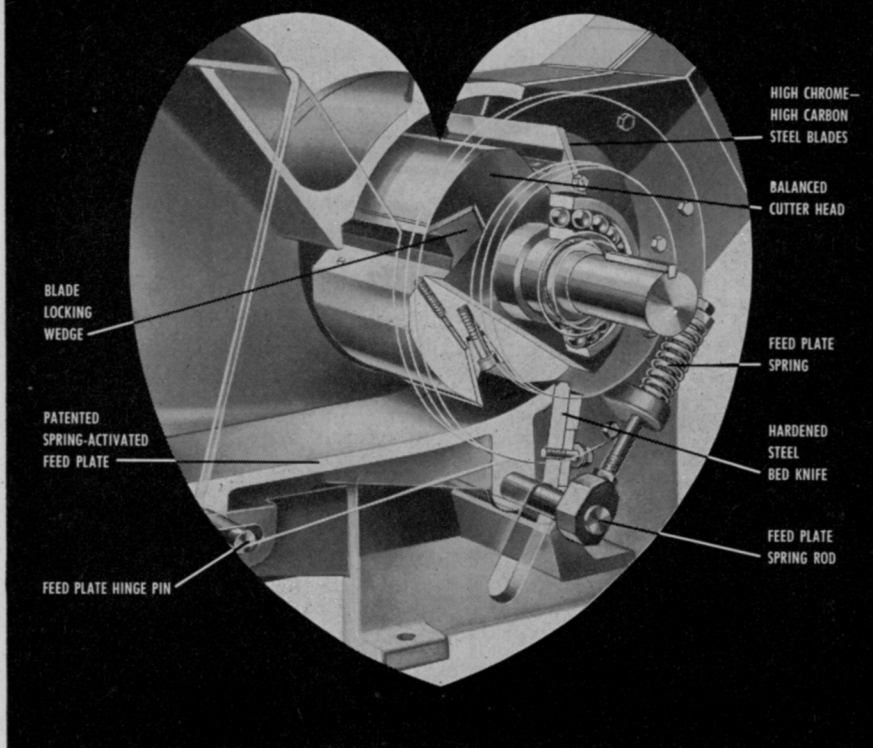
The R. H. Bogle Co., Alexandria, Va., is now headed by Ralph H. Bogle, Jr., son of the founder R. H. Bogle, Sr., who has been made chairman of the board of directors. Others of the family named to posts were John B. Bogle as vice president and secretary, and H. M. Bogle, treasurer.

Chevron Chemical's Ortho Division made these changes recently: Richard W. Goode is now assistant to the manager, western region, garden and home products, with offices at the company's headquarters in San Francisco; Steven T. Carlson has been appointed garden and home sales representative at Los Angeles; Douglas Eugene Pinguely recently joined the firm and is now sales representative for the Cincinnati, Ohio, area; and Keith A. Runge was recently assigned as a sales representative for agricultural chemicals in the Toledo, Ohio, area.

Thompson Mfg. Co. advises that Alan B. Jenkins was recently appointed director of marketing. A former vice president of the Bank of Los Angeles, Jenkins will be responsible for professional and consumer product lines. Thompson manufactures sprinkler and irrigation systems.

Union Carbide Corp. has sent Bruce I. Blackwell to Vienna, Austria, where he assumed duties as assistant regional manager for agricultural chemicals throughout Europe, the Middle East, and Africa. He is working under the direction of F. Gayle Kennedy, Euro-African regional agricultural chemical manager.

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Surfactants, Laborsaving Tools, Business Aids, Noted at Arborist's National Midwinter Meeting

By **DR. PAUL E. TILFORD**
National Arborist Association, Wooster, Ohio

A few thousandths of 1% of a wetting agent may reduce the repelling forces at the surface of a drop of water by as much as 60%, Robert A. Moore revealed during his discussion on wetter water at the recent midwinter meeting of the National Arborist Assn., at Tampa Fla.

Moore, of the Aquatrols Corp. of America, Camden, N. J., explained how to overcome some difficulties in watering trees and other plants. He pointed out that dry soil is slow to take up water and when the root ball of a newly planted tree is dry, water applied may run off to saturate the backfill and not penetrate the root ball.

Water treated with a wetting agent overcomes this tendency and will penetrate and wet the dry root ball. Moore reported many instances where watering the root ball of trees before planting and in regular maintenance after planting has proved beneficial. This practice has resulted in quicker starting and more rapid recovery by the tree after it is moved. Root damage and subsequent wilting is prevented by moisture that penetrates the root ball.

Fred Galle, director of horticulture, Callaway Gardens, explained many laborsaving tools used to develop and maintain the 2500-acre garden, recreational area, and golf course at Pine Mountain, Ga. Drills up to 24-inches in diameter, operated by power take-offs, are used in practically all tree and shrub planting. A large vacuum-type leaf collecting machine has been devised, and many other items of equipment have been modified or actually constructed in the shop at Callaway Gardens for a particular use.

Galle stressed the importance of good maintenance of all tools and equipment if they are to last and do properly the job for which they are intended.

Slides showing operation of a new tree mover were presented

by H. M. Van Wormer, Van Wormer Tree Service, Richmond, Va. The new tree mover for moving exceptionally large trees with a large root ball assures successful replanting because of the large amount of earth the machine scoops up with the tree. Relatively fewer roots are disturbed in the moving operation, and with proper backfilling and provision for proper drainage, a large tree will continue to grow at its new site.

Business management sessions included cost accounting, bookkeeping, office management, and the use of bookkeeping machines. George Goodall, Jr., Portland, Maine, Mrs. Jane Smith, Lansing, Mich., and John Duling, Muncie, Ind., conducted these sessions. The National Cash Register Co. demonstrated an accounting and bookkeeping machine for use by medium to large tree service companies.

Application of the Wage Hour Law to the tree-care industry was explained by Henry A. Huettner, regional director, Wage and Hour Division, U.S. Dept. of Labor, Atlanta, Ga. Recruiting men and good employment practices were discussed by Byron Harless, Industrial Psychologist, Tampa, Fla.

The next meeting of the National Arborist Assn. will be in conjunction with the International Shade Tree Conference at Cleveland, Ohio, August 28-Sept. 2, 1966.

Bean Has Rotomist Catalog

A new 8-page, 2-color, illustrated catalog describing use of four models of the Rotomist mist blower line, may be of interest to applicators who contemplate acquiring spraying or mistblowing equipment.

The catalog gives complete details and production capacities of the equipment. For a copy of Catalog L-1452, write John Bean Division, FMC Corp., Box 9490, Lansing, Mich. 48909.

Dyrene is formulated expressly for park superintendents, golf course superintendents, greens keepers, managers and other professionals engaged in the care and maintenance of lawns and turf.

Dyrene's broad spectrum effect combats or prevents all major turf diseases. When used as recommended, it controls: brown patch • copper spot • dollar spot • leaf spot • melting-out • rust • snow mold (*typhula* sp.).

Under normal weather conditions, apply Dyrene at the rate of 4 oz. per 1,000 sq. ft. every 7-10 days. During weather particularly favorable for disease, such as high temperature and humidity, Dyrene may be applied more frequently (5-7 day) or at higher dosages (6-8 ozs. per 1,000 sq. ft.) to keep disease under control with no injury to fine turf grasses. Frequently

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golf course and park superintendents use a Dyrene program of 3-4 ozs. per 1,000 sq. ft. of turf on a 12-14 day schedule. This has resulted in disease-free turf all season. When using Dyrene to clean up a disease condition in turf, use 6-8 ozs. per 1,000 sq. ft. for best results.

Dyrene is a 50% wettable powder that provides a good suspension in water and is suitable for use in all common types of spray equipment. The formulation is dyed green to blend with turf and eliminate the unsightly appearance of spray deposits on treated areas. Once dried, dye does not stain shoes or fabrics. Dyrene will not harm spray equipment, clog nozzles or corrode metal parts of the sprayer.

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Scientific Progress Toward Landscape Beauty

Highlights U. of California Conference

New findings from research and field experience in turf, landscape tree, and nursery production were featured during a special conference on the University of California campus at Davis, Feb. 23-25.

Converging on the campus for the three-day meet were almost 500 golf course and park superintendents, city landscape officials, nurserymen, and others.

Durable Turf

Agronomist from the University of California, Victor P. Youngner, described UC studies which indicate that *Puccinellia*

distans, hybrid bermudas, and *st. augustinegrass* are most tolerant to adverse conditions. He also cited recent studies which have listed salt tolerance of various bermudagrass varieties.

"Requirements for special soils such as putting greens are fairly well understood, although there are different ways of solving the problem," commented UC Landscape Horticulturist John Madison.

"Our principal ingredient in this mix is going to be sand, but we need at least 10% clay if we are going to grow the best grass with the least trouble," he con-



Representatives from all areas of the landscape tree and turf field converged on the University of California campus for the three-day conference.



Booming turfgrass industry in California was topic of Turf Day chairman Robert Lateer (left), of the Loamite Division, Pope & Talbot, Inc., San Francisco. In the center, salinity tolerance in turfgrasses is described in studies presented here by UC agronomist Victor B. Youngner. Sod Industry growth in California as related to ready-to-use yards for new buildings was described by Edward Mutoza (right), of California Turfgrass Nursery, Inc.



Landscape representatives at the conference were (l. to r.): Ed Price of San Francisco, president of the Western Chapter, International Shade Tree Conference; Austin Carroll, Sacramento arborist; Tom Wilson, director of Richmond Recreation and Parks Dept.; and G. P. Robinson of Sacramento, program chairman for the landscape tree event, and chairman of the Western International Shade Tree Conference.

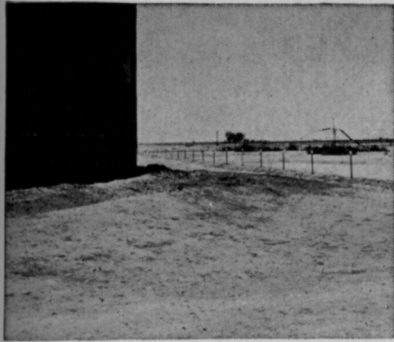
tinued. "More than 15% clogs the pores; less than 10% upsets the soil chemistry." Madison added that 10 to 20% organic matter will provide better fertility and water-holding capacity.

He pointed out that there are other, as yet untried, possibilities of solving the soil compaction problem in areas of heavy traffic.

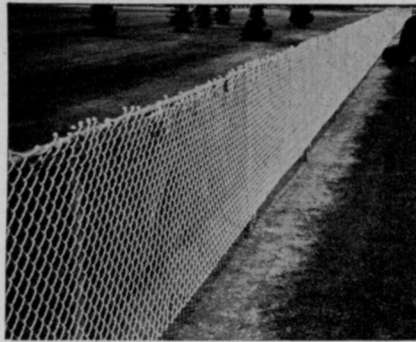
"For example, we could try using lumps of clay suspended in a sand matrix. Or we could build a green of alternate vertical columns of sand and soil. The sand columns could carry the weight, the water and the air; while the soil could provide the fertile growing medium," he theorized.

The business of growing vigorous turf, then stripping off the sod and selling it by the square foot is booming in California, noted Ed Mutoza of the California Turfgrass Nursery during another "Turf Day" talk. Mutoza, of Patterson, Calif., said the industry is expanding rapidly and cited heavy use by golf courses, and demand for finished landscaping along with new homes, motels, and apartment houses, as the chief causes of growth.

"A number of turfgrasses, mostly varieties of bluegrass,



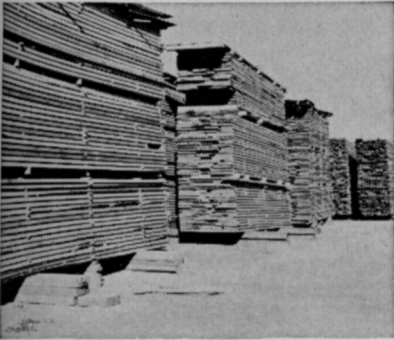
Around this oil pumping station—Hyvar® X bromacil weed killer controlled fire-hazardous vegetation all season. Other products containing bromacil, such as “Hyvar” X-WS, give equally effective control.



Under fence lines—Just one application of “Hyvar” X will control perennial weeds and grasses (such as Johnson, Bermuda, nut, horsetail, plantain, wild carrot, and bouncing bet).



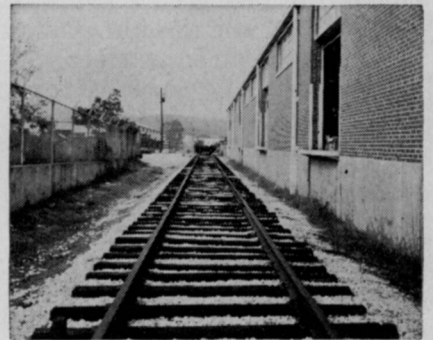
Around fire hydrants—“Hyvar” X is ideal for initial treatment of weeds and grasses because it offers broad-spectrum control and persists in the soil to give long-term, low-cost control.



In lumber yards—Control moisture-holding vegetation that tends to decay lumber. Unwanted vegetation also creates fire hazards during dry periods. Applying “Hyvar” X-WS bromacil prevents these problems.



Around storage warehouses, parking or work areas—Eliminate unsightly weeds that rust equipment, improve the over-all appearance of the sites with “Hyvar” X-WS.



On railroad sidings—Increase the operating efficiency of men and equipment by controlling perennial as well as annual weeds and grasses with “Hyvar” X-WS.

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fescus, and bentgrass, are grown as sod in California," Mutoza noted.

Home Pools Damage Trees

Careful study of the tree and its environment, plus close contact with specialists in plant pathology and other sciences, is vital in troubleshooting with landscape trees, Sacramento arborist Austin B. Carroll reported.

"Swimming pools on the downhill side of a tree can increase soil moisture, and at times enough to damage trees," explained Carroll.

Systemic insecticide implantation in some landscape trees will be commercially feasible, forecasted entomologist Carlton S. Koehler from UC, Berkeley.

Steam Sterilization

California nurserymen should make more general use of sterilization of soil by aerated steam, UC Plant Pathologist Kenneth F. Baker advised. He presented



Examining a tree section above are (l. to r.) entomologist Carlton S. Koehler, landscape horticulturist Andrew Leiser, and turf and landscape specialist William B. Davis.

research on the process along with UC Extension Engineer Robert Brazelton.

"It appears that the use of aerated steam to sterilize soil batches is a relatively simple process for which equipment can be constructed locally and at a low cost exclusive of the steam source equipment," Brazelton explained.

ISTC's Western Chapter Sets May 15-18 for Its 33rd Annual Meeting in Fresno, Calif.

"Trees . . . Living Symbols of Our Natural Beauty," is the theme toward which discussions and studies will be directed during the 33rd annual meeting of the Western Chapter, International Shade Tree Conference, May 15-18.

Ed Price, chapter president, announces the four-day meeting will take place at the Del Webb Town House, Fresno, Calif. Price, who is assistant to the president of Davey Tree Surgery Co., San Francisco, says that final arrangements are now progressing toward a highly educational program.

Subjects to be presented include: "Highway Beautification—The Federal Interest," "Quality in Trees," "Beautification—The Arborist's Obligation and Opportunity," and "Street Problems at 50° Below—100° Above."

Arborists attending this convention will be given a complete presentation of Fresno's Fulton Mall renewal project. Speakers

will give details on the planning, construction, and economic aspects of this well-known urban redevelopment program.

Greater national interest in highway beautification, transformation of drab city streets to tree-lined avenues of splendor, use of more trees in parks, industrial sites, and in every area where land improvement can be realized, will be topics of the convention.

Following the established custom, a past president's breakfast will be held early in the morning, May 16. A luncheon and the annual dinner are to be highlighted with speeches of pertinent interest. Visits to the region's parks, renewal areas and a post-convention tour of Yosemite Park are also planned.

Participating in various parts of the convention are: Jack Rogers, vice president, Western Chapter, ISTC; Brian Fewer, Municipal Arborists Committee, San Francisco; Riley Stevens,

Book Review

Insects in Relation to Plant Diseases

by Walter Carter, John Wiley & Sons, New York, N.Y., 1962, 705 p., \$25.00.

Describing explicitly the insect's relation to plant disease, this three-part volume will be of special interest to learned contract applicators and nurserymen.

In his well-arranged, generously documented book, *Insects in Relation to Plant Diseases*, Dr. W. Carter has revealed many mechanisms by which fungi, bacteria, and viruses are transmitted by insects. Characteristics of disease conditions caused by insect feeding or egg-laying, insect infestations, and salivary toxins are meticulously described and clearly exemplified by numerous illustrations.

Of the 13, technically written chapters, seven deal with plant viruses. These chapters provide basic, up-to-date information on the biological nature, classification, vector relations, and ecology of viruses which cause plant diseases.

Chemical, cultural, biological, and insect vector control are methods explained in the last chapter which is devoted to control of viruses and virus diseases of plants.

Diseases of various plant groups are covered. Diseases of ornamental, shade, and fruit trees are discussed, and many agronomic crop diseases are included.

Readers interested in how organisms cause disease conditions in plants and how insects expedite plant infection are certain to benefit from this technical volume.

chapter past president; James Poindexter, of Sacramento, Utility Arborists Committee; Roy Wells, chapter past president; and Austin Carroll, Commercial Arborists committee, of Sacramento.

More information and reservations can be obtained by writing to the Parks and Recreation Department, City of Fresno, 890 W. Belmont Ave., Fresno, Calif. 93728, Att. Sam Setencich.



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What to Consider When You Plan Irrigation Systems

(from page 11)

to 80% of their effective diameter should not be expected to give any degree of uniform application consistent with good irrigation; 50% variations in water depth may be expected.

Large-volume guns should be spaced no greater than 50% of their effective diameter. Winds greatly distort their pattern because of their higher operating pressures and trajectory angle of the spray.

Power Unit Affects Output and Cost

The power unit has a direct relationship on pump output and operating costs of the entire system. The continuous brake-horsepower (c.b.h.p.) required of a pumping power unit is expressed as:

$$\text{c.b.h.p.} = \frac{\text{GPM} \times \text{TDH}}{3960 \times \text{Efficiency}}$$

TDH is the total dynamic head (distance, in feet, that a pump will push water in a pipe straight up); "Efficiency" of the pump is expressed as a decimal, and GPM = pump output, gallons per minute.

Selection of an engine for a power source of the pump should be based on the continuous service rating (c.b.h.p.), rather than the maximum brake-horsepower (BHP) rating. The engine should be loaded to no more than 80 or 85% of its maximum power. However, diesel engines can be driven harder.

Gasoline, diesel, LP-gas, and electric motors are all used for irrigation power units. Each has advantages and disadvantages,

and Table 3 shows ratings of each type.

Gasoline engines have two principal advantages over diesel and LP-gas engines. These are (1) lower initial costs and (2) service is more readily available. On the other hand, diesels have a longer life. LP-gas engines require less maintenance than gasoline engines, and fuel is cheaper. Another advantage of LP-gas is that fuel cannot be taken by "night raiders." The cost of operating LP-gas engines is approximately the same as for gasoline engines if LP-gas is available for about 2/3 to 3/4 the price of gasoline.

When available at reasonable rates, electric motors are one of the most satisfactory sources of power. Their dependability and long life make them desirable. The most common electric motor used for pumping plants is the 60-cycle, 220-240 volt, 3-phase, squirrel cage induction motor. The speed of these motors under full load is nearly constant.

Single-phase motors are often used for loads up to and including 5 horsepower. However, 3-phase motors are more efficient. Above 5 horsepower, single-phase motors are not efficient enough for irrigation pumping. Electric motors above 5 horsepower generally should have an efficiency of between 88% and 90%. Most squirrel cage induction motors operate satisfactorily under a continuous 10% overload.

Electric motors should always be protected against excessive heating due to overloading or undervoltage. In addition, larger motors will require a starter or starting compensator.

The following formulas may

be useful to compute pumping costs when you decide whether to use electricity or internal combustion engines. However, this is only on the basis of operating costs. Fixed costs should also be weighed before a final decision is made.

Pumping Costs:

- (1) Internal Combustion Engines:

Hourly pumping costs =

$$\frac{Q \times h \times F_c \times d}{3960 \times E} \quad (\text{in cents})$$

Where: Q = Discharge in GPM
h = Pumping head in feet

F_c = Fuel consumption in Gal. per HP hour
d = Cost of fuel in cents per gallon
E = Pump efficiency

- (2) Electric Motors:

Hourly pumping costs =

$$\frac{Q \times h \times c}{5310 \times E \times e} \quad (\text{in cents})$$

Where: Q = Discharge in GPM
h = Pumping head in feet

c = Cost of elec. in ¢ per KWH
E = Pump efficiency
e = Efficiency of electric motor

Consult Dealer Before Selecting Pump

Selection of a pump for an irrigation system should be a joint decision by you and a local reputable pump dealer. The trained pump dealer must be familiar with local well and water conditions. His recommendations should be based on three primary conditions: (1) the amount (rate) of water and pressure you need; (2) the specific water source and conditions; and (3) the size of investment you plan to make.

Two Pumps Used Most

Probably the two most common types of pumps used are (1) horizontal centrifugal pumps and (2) vertical centrifugal (or deep well turbine) pumps.

Horizontal centrifugal pumps are used where ample and dependable surface water is available from wells or lakes at suction lifts of less than 15 to 20 feet. This pump is generally used in irrigation because of its low initial cost and high operating efficiency. The pressure the pump develops depends on

Table 3. Average performance of irrigation pumping units from Nebraska tests.

Power Unit	Max. Possible BHP Hrs./gal.	Avg. Fuel Consumption BHP Hrs./gal.	Annual Costs (Oper. & Maint./100 hrs.) ***
Gasoline	11.2	6.9	\$11.40
Diesel	15.2	11.2	\$15.34
Propane	8.7	5.7	\$10.99
Natural Gas	8.3*	5.4*	\$11.50
Electricity	1.20**	0.93**	\$ 1.00

*BHP—Hours/100 cu. ft. gas.

**BHP—Hours per KW.

***For 1000 or more hours use annually.

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SEVIN is the registered trade mark of Union Carbide Corporation for carbaryl insecticide.



AGRICULTURAL PRODUCTS

STICKTIGHT (*Lappula echinata*)



Sticktight was introduced from Europe and Asia and is now widespread in the United States. It is found growing commonly in dry or sandy soil near roadsides, wooded areas, fencerows, and in industrial waste areas.

L. echinata is classed as an annual or winter annual and reproduces by seeds only. Other common names for this species include blue stickseed, burweed, bluebur, and sheepbur.

Its root is a deeply penetrating taproot type with numerous lateral branches.

Stems (4) are rough and covered with short, white, fine hairs. These give the stalk a grayish appearance. The slender stem grows erect from 1 to 2 feet tall and branches widely at the top.

Leaves grow alternately from the stem and are also covered with soft white hairs. In the mature plant, leaves are from 1 to 2 inches long and from 1/16 to 3/16 inches wide. Young plants show a rosette form (3) of leaves which spread near the crown at ground level. Seedlings (1) have only 2 leaves.

Flowers are small and have 5 blue petals. They are borne in the leafy tips and leaf axils (7) of the upper branches of the plant. This plant generally blooms during June and July.

Seeds (5) are produced in nutlet form by four-lobed, female flowers. At maturity, the spiny flower splits into four segments (2), each composed of one burry nutlet seed. Each seed is about 1/8 inch long, grayishbrown, and has a narrow scar (6) along one side. Seeds are unsymmetrically pearshaped overall with a double row of barbed spines on each side. The spined nutlets readily stick to animal hair or human clothing, and thus seeds sometimes are carried great distances to new sites. Plants are seldom eaten by livestock. It has a disagreeable odor.

Sticktight can be effectively controlled by closely mowing the plants before seed matures. It does not survive under cultivation. In the autumn or early spring, young rosettes should be cut below the crown at ground level. If sprayed before bloom 1/2 to 3/4 pound of 2,4-D per acre will control this weed.

Prepared in cooperation with Crops Research Division, Agricultural Research Service, United States Department of Agriculture, Beltsville, Maryland

(DRAWING FROM NORTH CENTRAL REGIONAL PUBLICATION NO. 36, USDA EXTENSION SERVICE)

the rim speed and design of the impeller. They should always be operated at the recommended RPM; when we increase the speed one-third, the horsepower requirements are more than doubled.

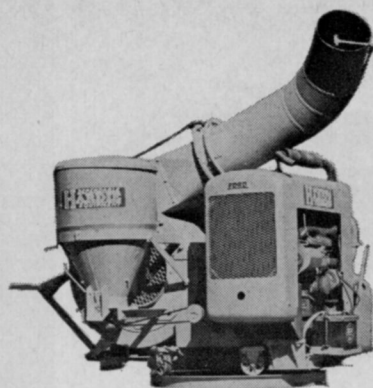
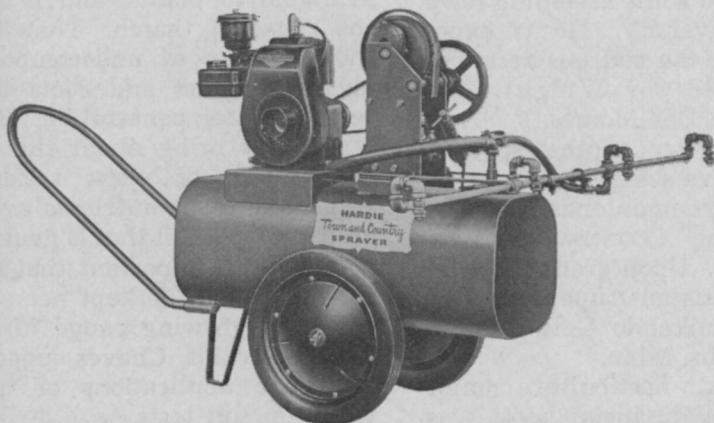
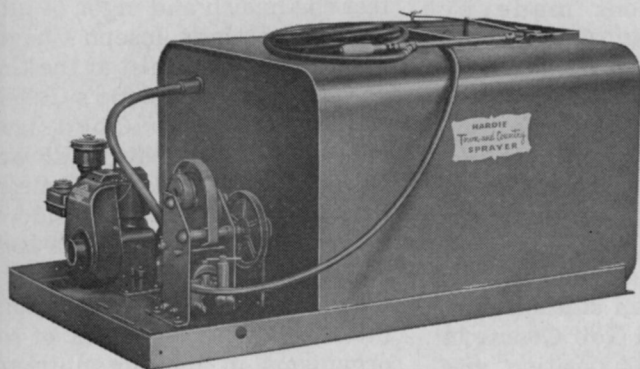
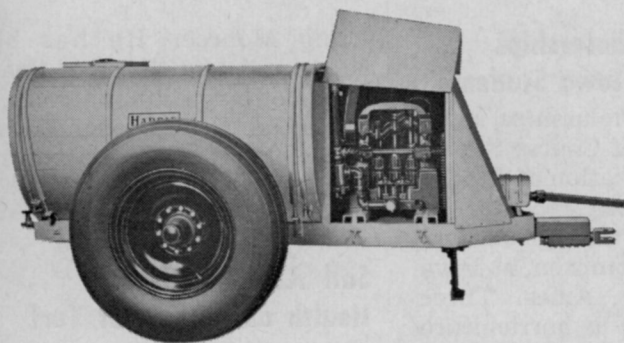
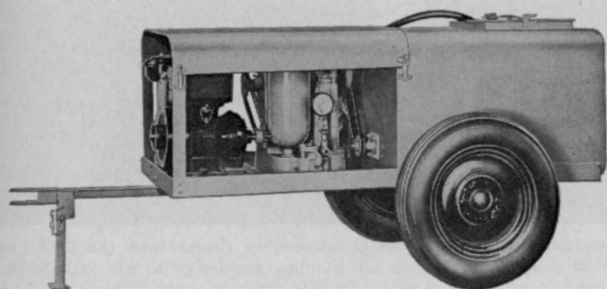
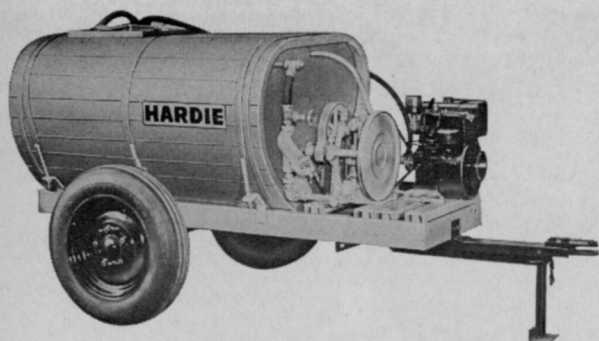
The vertical or turbine pump has performance characteristics very similar to those of centrifugal pumps since they both operate under the centrifugal principle. Turbines, however, cannot operate at a high efficiency over the wide range of conditions that horizontal centrifugal pumps can.

Consider Pump Efficiency

Pumping at a rate of 450 GPM will deliver approximately one inch of water on one acre in one hour (one acre-inch). Thus, for a water requirement of one-half of an acre-inch per hour, a flow of $\frac{1}{2} \times 450$ or 225 GPM is needed.

The efficiency of a pump is very important. Consider a 40-acre permanent system where the field is to be irrigated in quadrants, and the pump required is to have a 450-GPM output at a 250-foot TDH. If we select a pump with 70% efficiency, the horsepower requirements are 40 continuous brake-horsepower (c.b.h.p.). In the same situation, if we are careful and choose a pump with an efficiency of 83%, the horsepower required is reduced to 35. Operating 720 hours annually (9 irrigations each at 0.15-inch per hour), using an LP-gas engine with fuel at 12¢ per gallon, the annual fuel savings, alone, is approximately \$100. This results by using the most efficient pump, and there are additional savings by purchasing the smaller motor.

Selection of an irrigation system should be based on all factors concerned. Determination of the soil moisture conditions, uniformity of application, sprinkler spacings, and both fixed and operational costs should be based upon current research and on good engineering concepts tempered by local field experience.



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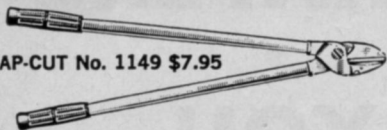
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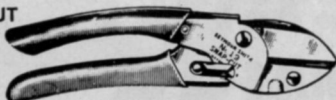
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10 foot	\$6.50
12 foot	\$6.95

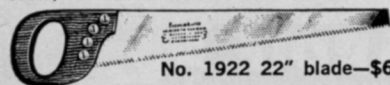


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Iowa State University student recipients of \$400 scholarship checks from the Golf Course Superintendents Association of America are these horticultural seniors (l. to r.): Jack Burns, of Waverly; Larry Vetter, Muscatine; and Craig Monroe, Charles City. At right is Professor Edward Cott, acting chairman, Horticulture Department and Extension Turfgrass Specialist at the University. Dr. Louis M. Thompson, associate dean of agriculture, is seated.

\$400 GCSAA Scholarships Awarded Three Iowa Students

Three \$400 scholarships sponsored by the Golf Course Superintendents Association of America were presented recently by Associate Dean of Agriculture, Dr. Louis M. Thompson, at Iowa State University, Ames. Three seniors majoring in horticulture received the checks which came from contributions made by National Golf Day, GCSAA exhibitors, industrial firms and other commercial groups, and the GCSAA general funds.

One recipient, Jack Burns, gained golf turf experience at Washington Park Golf Course in Cedar Falls, at Waverly Golf and Country Club, and for the past year has been superintendent at Homewood Golf Course in Ames. The latter position was maintained while attending Iowa State University. He is experienced in the sod business and has worked for Wright Tree Service in Des Moines.

Larry Vetter, another scholar, has had five seasons' experience in golf turf maintenance at the Park Lane Country Club in Muscatine. Upon graduation, he will be assistant superintendent at the Minikahdo Golf Club in Minneapolis, Minn.

The third horticulture major receiving a financial boost was

Craig Monroe. He has been superintendent at the Charles City Country Club where he has gained golf course maintenance experience for the past seven summer seasons.

Soil Acidity Affects Health and Vigor of Turf

Soil acidity can seriously affect the health and vigor of turfgrasses, reminds Joseph Chaves, extension agronomist at the University of Rhode Island's College of Agriculture. Good lawn grasses will not grow or do well on highly acid soils. This means that liming has to be considered a very important part of a lawn management program.

Chaves notes that high acidity interferes with the work of soil organisms in making nutrients available to plants, and is also the cause of thatch. Thatch is the buildup of undecomposed layers of grass and roots that retards water penetration. Bacteria, that bring about the decomposition of plant residues and make plant nutrients available, prefer a soil that is neutral.

It is quite important that soil for turfgrasses be kept near the optimum growing range of pH 6.5. To do this, Chaves suggests periodic applications of lime based on soil tests.

Industrial Pollution Big Factor in 1964 Fish Kill

Dr. James Dewey, Chemicals-Pesticides Program Leader for New York State, recently released the following statement, "According to the Public Health Service (PHS-847 (Rev.), they received 485 official reports of fish kills in 1964 in fresh and marine waters of the United States. This is the largest number of reports ever received and the number of fish killed was also the largest, an estimated 18,387,000. These figures are an increase over the 436 reports of an estimated 7,860,000 fish killed in 1963.

Industrial pollution (193 incidents) accounted for the largest number (12,715,000) of fish killed. Municipal wastes (122 reports) resulted in the death of 4,100,000 fish, while toxic substances from agricultural operations were responsible for the death of 1,522,000 fish (193 reports). Transportation and other operations were responsible for the remaining 43 reports (50,000 fish).

Over half the number of kills

and two-thirds of the fish killed were reported in the 3-month period July through September. Roughly 15 percent of the fish found dead were game fish and the rest were nongame fish. An estimated 6 million of the more than 18 million fish killed were of some commercial value.

The following chart indicates the number of fish killed by the various agricultural operations comprising the total for agricultural (1,522,000):

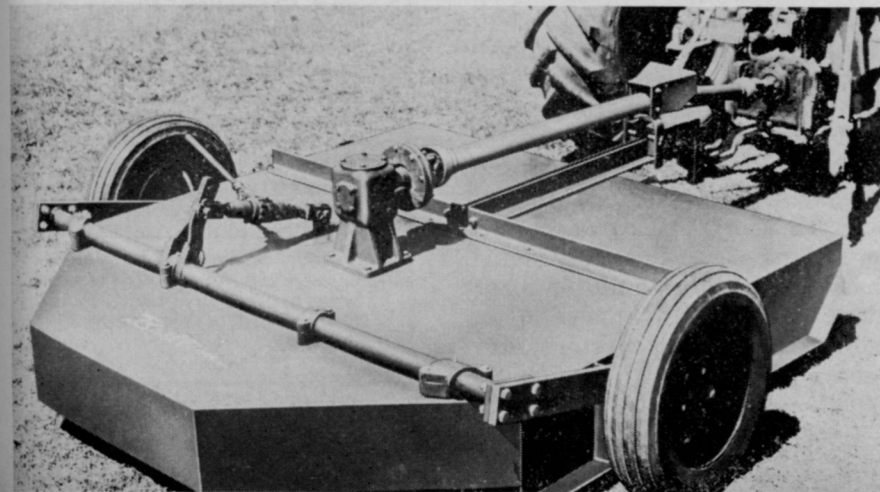
Thus, pesticides were associated with 75% of the agricultural incidents and 19 percent of the total number of incidents reported. However, this 19 percent of the reported incidents accounted for only about 1% of the total fish killed by all pollutants.

Combined industrial operations (e.g. steel and coke operations) were the largest reported cause of fish kills. Sewage was the most serious cause of fish deaths arising out of municipal operations and land drainage the most serious cause arising out of agricultural operations.

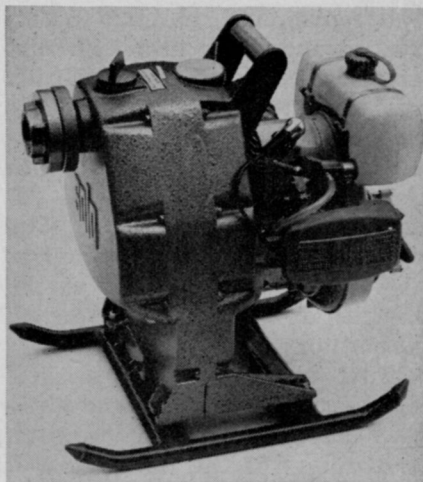
Source of Pollution	Total Number of Reports	Number of Verified Reports	Number of Fish Killed
Pesticides, poisons, etc.	93	74	191,167
Fertilizers	5	4	67,040
Manure-silage drainage	29	26	1,156,885
TOTAL.....	127*	104*	1,415,092*

* The other reports totaled an estimated 106,908 fish.

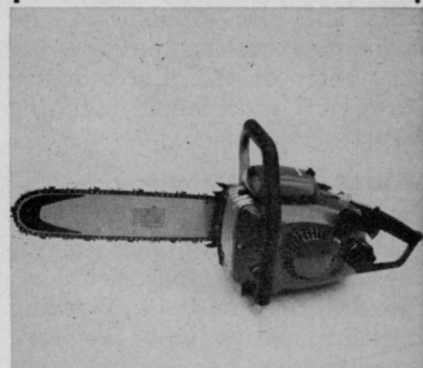
Rugged construction to match today's more powerful tractor is built into the Model R-84, 7-ft. rotary shredder, says Brillion Iron Works, Inc. Shredder housing, with 12½-inch skirts, is made of ¾-inch steel plate. Welded angles underneath provide added strength, act as baffles for finer shredding. Two blades of ½ by 4 in. heat-treated spring steel are shaped for high clearance under the center of the machine, and are tilted on the back for better suction and cleaner pickup of knockdowns. Three-knuckle shielded PTO with shear yoke, full-skid shoes, heavy-duty gear box, and reversible wheels are other features. The machine is available either at 540 or 1,000 rpm speeds. Hydraulic control of cutting and transport height ranges from 1 to 14 inches. Additional information on the new R-84 can be had by writing Brillion Iron Works, Inc., Brillion, Wis. 54110.



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Management Clinic to Offer More Aid for Turfmen At Florida Turf-Grass Trade Show, April 28-29

Efficiencies and economies that can be realized in a long-range plan, and solutions to personnel and labor problems that actually occurred with Florida turfmen, will be presented to members of the Florida Turf-Grass Assn. attending the 5th Annual Trade Show, April 28-29, in Fort Lauderdale. The event is to be headquartered at the Sheraton Hotel and at the Plantation Field Research Laboratory.

Turf and spray men; golf course, cemetery, park and highway supervisors; sod growers; and others of the industry will attend the morning-long management clinic to hear Dr. James R. Watson, director of agronomy division, Toro Mfg. Co., Minneapolis, Minn., and Dr. William Fox, College of Business Administration, University of Florida, Gainesville.

Watson, a nationally known turf authority, will discuss the urgent need for long-range planning and the efficiencies and economies that can be realized in all phases of the turf industry through a coordinated planning effort.

Will Use Case Histories

Fox will conduct an audience-participation discussion of the personnel and labor problems found in the turf field. Working from numerous case histories, which are being selected from FT-GA members, Fox will present the means to solve specific situations and their application in the broad area of labor management techniques.

Meeting in Ft. Lauderdale for the second consecutive year, industry men will be exposed to more than two full days of exhibits, educational tours of research plots, product and equipment demonstrations and, apropos to the occasion, an entertainment program to completely preoccupy the attending delegate and his family.

A total of 64 booths will offer product and equipment displays

at the hotel, with additional exhibits housed elsewhere in the hotel area. The University of Florida's turf research program and the Florida Department of Agriculture's Turf-Grass Certification Program will occupy demonstration sites.

A field laboratory program, slated for Thursday, April 28, will be guided by Dr. Evert O. Burt, associate turf technologist. Guided discussions will be held to review turf research programs conducted during the past year.

Afternoon demonstrations by show exhibitors will simulate every growing condition including putting greens and lawns, mowing procedures, irrigation systems, aerating and verticutting equipment.

During the show other groups have scheduled meetings. Sod growers and the South Florida Association of Golf Course Superintendents will meet in separate luncheons April 29, and the Florida Turf-Grass Trade Association Board of Directors will remain for a meeting Saturday.

The Florida Turf-Grass Trade Show is sponsored by the Florida Turf-Grass Assn. Co-chairman of the event are Dr. Evert O. Burt and Walter D. Anderson, executive secretary of the FT-GA.

More information may be obtained from the FT-GA offices, 4065 University Blvd., N. Jacksonville, Fla. 32211.

T-H and De-Pester Merge

Recent merger of the Thompson-Hayward Chemical Co. with De-Pester Western Inc., greatly improves distribution facilities for Thompson-Hayward, particularly in the Pacific Coast States, reports Robert S. Thompson, president.

E. F. Schroeder, Jr., formerly president of De-Pester Western, has been appointed a vice president of T-H and manager of the newly established western division.

Meeting Dates

New Jersey Society of Certified Tree Experts, Annual Dinner, Rock Spring Corral Inn, West Orange, April 12.

New Jersey Society of Certified Tree Experts, Meeting, Andrew Wilson Co., Springfield, April 18.

5th Annual Florida Turf-Grass Trade Show, Sheraton Hotel and Plantation Field Research Laboratory, Ft. Lauderdale, April 28-29.

Mississippi Valley Golf Course Superintendent's Assn., Meeting, Glen Echo Country Club, St. Louis, Mo., May 4.

Florida Nurserymen and Growers Assn., Convention, Sheraton's British Colonial Hotel, Nassau, May 12-14.

International Shade Tree Conference, Western Chapter, Annual Meeting, Towne House, Fresno, Calif., May 15-18.

Mississippi Turfgrass Conference, State College, June 6-7.

18th Annual Nurseryman's Refresher Course, Cal-Poly College, San Luis Obispo, Calif., June 7-8.

Mississippi Valley Golf Course Superintendent's Assn., Meeting, Greenbriar Country Club, St. Louis, Mo., June 8.

Hyacinth Control Society, Annual Meeting, Ramada Inn, Lakeland, Florida, June 19-22.

New Jersey Society of Certified Tree Experts, Meeting, Essex County Highway Dept., Verona, June 20.

Mississippi Valley Golf Course Superintendent's Assn., Meeting, Westborough Country Club, St. Louis, Mo., July 13.

American Association of Nurserymen, 91st Annual Convention, Palmer House, Chicago, Ill., July 16-20.

Indiana Association of Nurserymen, Inc., Summer Meeting, Purdue University, West Lafayette, Aug. 8-11.

Midwest Turf Field Days, Purdue University, West Lafayette, Ind., Aug. 15-16.

Texas Assn. of Nurserymen, Annual Convention, Nursery and Garden Supply Show, Dallas Memorial Auditorium, Dallas, Aug. 21-24.

Penna. Grassland Council, Materials Handling Field Day, John Rodgers (Plum Bottom) Farm, Belleville, Aug. 26.

Hawaiian Turfgrass Management Conference, University of Hawaii, Honolulu, Aug. 25-26.

International Shade Tree Conference, 42nd Annual Convention, Sheraton-Cleveland Hotel, Cleveland, Ohio, Aug. 28-Sept. 2.



Heading the Weed Society of America for 1966 are (left to right) F. W. Slife, treasurer; E. G. Rodgers, editor, *Weeds*; R. Behrens, president-elect and chairman of the program committee; W. R. Furtick, Society president; G. C. Klingman, executive committee; D. L. Klingman, secretary.

Experimental Herbicides for Weed Control Described at Annual WSA St. Louis Meeting

New approaches to selective weed control with new and experimental herbicides highlighted talks during the February meeting of the Weed Society of America at the St. Louis, Mo., Sheraton-Jefferson Hotel.

Nearly 800 weed specialists from throughout the United States, Canada, Puerto Rico, and Hungary registered for the Weed Society Conference which also included discussions of public acceptance of the industry, weed and woody plant control on rights-of-ways and other industrial sites, weed control in turf, and aspects of the employment problem in the industry.

Chlorophyll Inhibitor

An experimental herbicide, Rowmate, known chemically as 3,4-dichlorobenzyl methylcarbamate, was described by Union Carbide Corp. scientists, Dr. Richard A. Herrett and Robert Berthold, discoverers of the compound. They reported the material kills susceptible weeds by inhibiting the synthesis of chlorophyll, the green components vital to growth of plants.

Weed control over an extended period under relatively dry conditions is made possible because

the herbicide remains in the upper one-quarter inch of the soil profile, the two Carbide scientists explained.

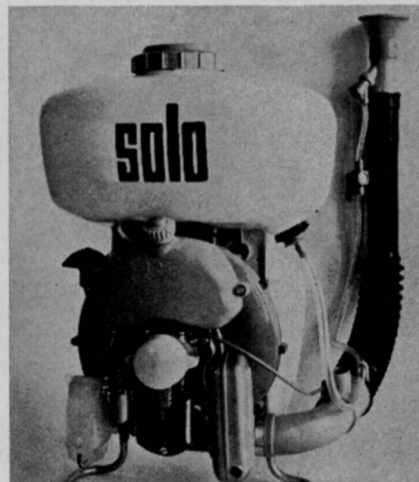
Weed Reports on Siduron

Another new approach to weed control was presented by E. I. duPont de Nemours & Co. senior research biologist, Dr. Mark B. Weed, who told how research indicated the compound siduron prevents crabgrass root growth while not affecting roots of common cool-season lawn grasses. The chemical is the active ingredient in duPont's "Tupersan" siduron weedkiller, introduced in 1965.

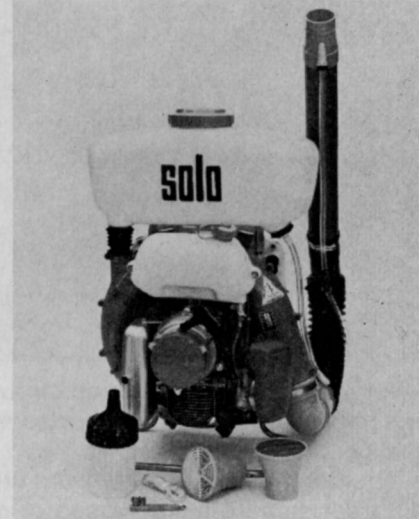
Dr. Weed described one test where siduron was positioned in a layer one-half inch below the surface of soil seeded with crabgrass and bluegrass. Crabgrass seed germinated but roots were unable to penetrate the chemical barrier. In contrast, bluegrass roots passed through the siduron layer.

Dr. Weed also reported that repeated yearly applications of siduron had little or no effect on root systems of many established cool-season turf species, even when the chemical is applied at extremely high rates. He based

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Year in and out, still the pro for medium duty use. That's the SOLO JR., the knapsack mistblower that weighs only 15 lbs.! Its easy portability and unparalleled efficiency have made it the choice of thousands across the country. Use the coupon on page 47 to get the details. P.S. Did you know SOLO also builds the world's foremost heavy duty self-propelled motorscythe?



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Now HOOKER TRITAC™ the proven bindweed killer costs you 40% less



Nowhere can you get **proven** bindweed control for less than what you pay for Tritac. We've cut its price 40%. Yet, you still get the same high quality.

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Tritac sinks deep into root zones to control bindweed and many other problem perennial weeds. It can be used along fence rows, roadways, bridge abutments, on industrial sites and other noncrop land.

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Ask your dealer about Tritac, and about Tritac-D for faster foliage top kill, and about easily applied Tritac-10G granular formulation.

Or write us. Agricultural Chemicals, Hooker Chemical Corporation, 404 Buffalo Avenue, Niagara Falls, N.Y. 14302.



AGRICULTURAL CHEMICALS

this conclusion on tests that extended for four years.

One series of plots was treated with siduron at five times the maximum recommended rate, or 60 lbs. per acre per year for three years. Another series was treated with 16 lbs. per year for four years, and a third series received 15 lbs. for one year. Then root samples of three different turf species were removed, observed, and weighed. They showed even the overdoses of siduron had little or no effect on root species, Dr. Weed reported. He said studies indicate the major means by which siduron disappears from the soil is through microbial degradation.

NIA 11092 for Broadleaves

NIA 11092, an experimental industrial herbicide for soil sterilization and brush control on railroad, highway, and utility rights-of-way, shows promise according to a discussion of the chemical developed by Niagara Chemical Division, FMC.

Soil sterilization, according to the report, can be accomplished with 4 to 6 lbs. of NIA 11092, 80 WP per acre, for annual weeds. For fibrous-rooted perennial weeds, from 8 to 12 lbs. of NIA 11092, 80 WP per acre, was recommended. Applications from 15 to 25 lbs. per acre were suggested for long-term residual control of perennial weeds having underground rootstocks.

The compound was described as excellent for brush control (including hardwood and coniferous species) when mixed at a rate of 2.5 lbs. NIA 11092 80 WP plus surfactant or 2 gals. of 1 EC per 100 gals. of water and sprayed to thoroughly wet the foliage.

Experimental SD 11831

Shell Development Co. experimental herbicide SD 11831 was another preemergence selective weed control product spotlighted at the meeting. SD 11831, at a dosage of 1 to 2 pounds per acre, was suggested for weed control in turf.

It was reported that sprinkler irrigation has been an effective means of incorporating SD 11831 following surface applications. For turf work, experimental

granule formulations containing 0.25-1% active ingredient will be available.

Money in Weeds?

Speaking of the opportunities available in the weed control industry, T. J. Sheets, weed control scientist with North Carolina State University, said:

"There are more than twice as many jobs available in the industry than there are people to fill them. Salaries range from 9 to 15 thousand dollars a year in the weed control industry for people with Ph.D. degrees." Sheets commented that many of the jobs require master's degrees or Ph.D. training, but research technicians are also needed.

In charge of the Society's job placement service, Sheets added that the program comes to a climax each year at the annual meeting, when interview rooms are reserved and lists of openings and applicants are provided to bring prospective employers and employees together.

Furtick Elected President

Agronomy professor at Oregon State University, Corvallis, Dr. W. R. Furtick, was elected WSA president for 1966. President elect for the coming year is Dr. Richard Behrens, professor of Agronomy at the University of Minnesota, St. Paul. Elected secretary is Dr. Dayton L. Klingman, Research Branch, United States Dept. of Agriculture, Washington, D. C. New executive committee members at large are Dr. Glenn C. Klingman, North Carolina State University, and Gideon D. Hill, weed control researcher with duPont in Wilmington, Del.

Tree Wound Dressing Is Handy

A new 16-oz. container with a built-in applicator is now used by Seymour Smith & Son, Inc., for distribution of its tree wound dressing.

Use of the tree dressing in this new container makes it easy to apply while tree pruning is in progress. More details can be obtained from the company at Oakville, Conn. 06779.

Merck Acquires Metalsalts

In a statement jointly issued by Merck & Co., Inc., and Metalsalts Corp., it was announced that the latter has been acquired by Merck.

Metalsalts, a privately owned company, has its offices and plant in Hawthorne, N. J., and a subsidiary near Montreal. Its principal products are industrial chemical specialties used extensively to protect against fungus and bacterial growth in many products and in agricultural fields. Metalsalts will continue to operate under its own name with its present staff and facilities.

Henry W. Gadsden, president of Merck, said, "The acquisition provides Merck with a growing research-oriented operation in a field that is new to us."

Frit Fly Is Turfgrass Pest

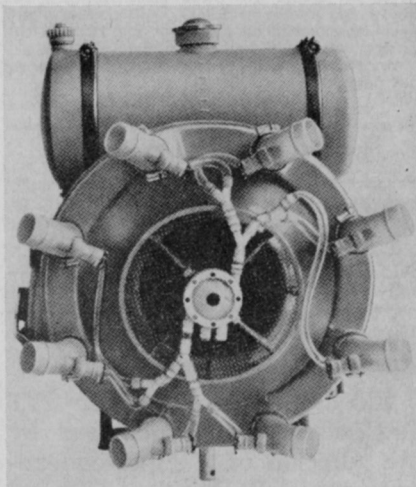
The frit fly has recently become a pest of turfgrasses, reports Gordon Watts, head of the department of botany and entomology at New Mexico State University.

Watts reveals that the frit fly is now a pest of grasses used on golf greens at University Park and in El Paso. So far, he says, this condition has not been reported as a problem in northern New Mexico. The frit fly, usually smaller than the common fruit fly, has been a problem to European farmers for many years, attacking small grains and corn. It has not attacked these crops in the United States.

Two reasons may account for the recent attacks of the insect pest on turfgrasses. One is that resistance to the insect has been bred out of the grasses used for turf, and the other is that a mutation may have occurred in the insect. Watts stresses that this is a speculation and not a scientific fact.

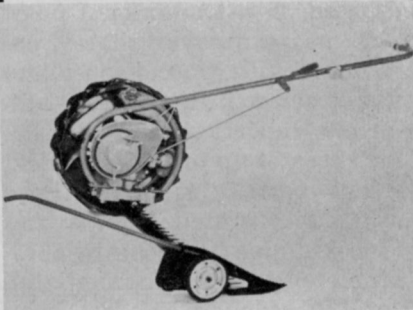
The frit fly's ability to travel great distances would limit control measures to a local pattern, because of reinfections from migrations of the fly. A safe insecticide such as malathion might be used as a stopgap, Watts advises.

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Below is the famous SOLO Motor Scythe with 3½ ft. cutter bar, a self-propelled workhorse for mowing stubborn grass and weeds. Excellent for those hard-to-reach places like steep slopes, bridge abutments, drainage ditches, underfence areas, etc. Dealer inquiries invited. Send the coupon for details.



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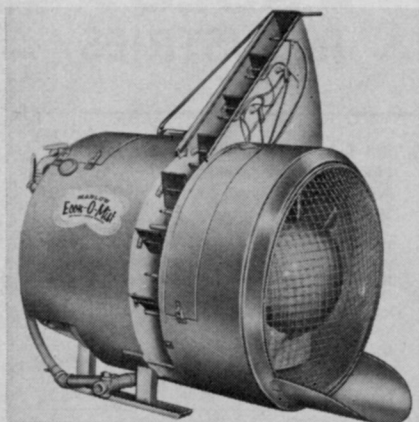
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AERIFIER, Grassland, West Point. 6-ft. pull type. Nearly new. \$600. Hornbuckle Lawn Service, 1002 E. 117th St., Kansas City, Mo. Phone: 816-942-3310.

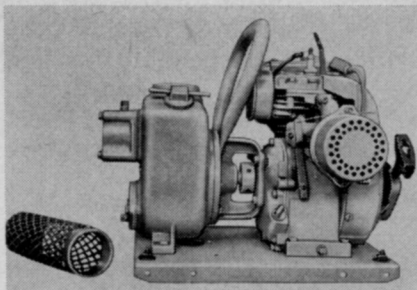
Marlow Adds "Econ-O-Mist"

"Econ-O-Mist" line from ITT Marlow has been increased by the addition of a super-concentrate air-blast sprayer. The improved model has a more efficient 36 in. fan to provide high air volume the company claims.

Increased air volume assures complete penetration and coverage of dense trees and treetops. The new super-concentrate air-blast equipment features no drip or runoff, one-man spray operation, 1½ to 6 hours running time between refills, and a corrosion-proof stainless steel tank. The air-blaster, which can be mounted on a trailer or 3 point hitch, has a sprayer that is coordinated with ground speed and uses tractor power-take-off. Marlow reports that "Econ-O-Mist" creates up to 25% chemical savings, permits use of 33 times more concentrated liquids and reduces engine fuel costs by 66%. Complete details are available from ITT Marlow, Box 200, Midland Park, N. J.



"Econ-O-Mist" can spray strong concentrates.



New, light in weight, this Universal fertilizer pump has highly resistant seals, the company says.

Universal Introduces Pump

A fertilizer pump equipped with a special seal, claimed to be highly resistant to a wide variety of liquid fertilizer and insecticide preparations, was recently introduced by Universal Motor Co. The lightweight portable unit is said to have a capacity of 7200 gph with either 1½- or 2-inch suction and discharge outlets. Users may choose Briggs & Stratton, Clinton or Lauson power plants.

The company reports that extensive tests disclosed no measurable seal deterioration after extended exposure to a number of liquid fertilizer products.

Write J. F. Dunn, Universal Motor Co., 1552 Harrison St., Oshkosh, Wis., for further details.

Thickening Agent by Hercules Improves Spray Operations

An extra-high viscosity grade of hydroxyethyl cellulose, developed for the thickening of herbicide sprays, labeled "Vistik," is now marketed by Hercules Powder Co.

Said to have been extensively tested under a variety of field conditions, Vistik enables operators to substantially reduce drift, increase spray effectiveness, and substantially reduce downtime. Tests were made with conventional helicopters and ground spraying equipment.

Vistik solutions can be prepared quickly, are readily dispersible in water, and are applicable in water-soluble, emulsifiable, and suspended herbicides, the company reports. Thickened herbicide sprays form relatively coarse drops giving good foliage coverage that ad-

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heres to vegetation with a minimum of drift. Vistik is used in concentrations of less than 1% in water.

Interested applicators can obtain more information by writing to Cellulose & Protein Products Dept., Hercules Powder Co., Inc., Hercules Tower, Wilmington, Del. 19899.

Morton Offers Seed Guide

A comprehensive, 32-page booklet on seed treatment is now available to members of the turf-grass industry, Morton Chemical Co. announces. Full-color illustrations of plant diseases, their symptoms, and control, are included in the new publication.

This guide was prepared by well-known agricultural experts associated with experiment stations in the United States and Canada.

A free copy may be obtained from James Greer, Morton Chemical Co., 110 North Wacker Drive, Chicago, Ill. 60606.



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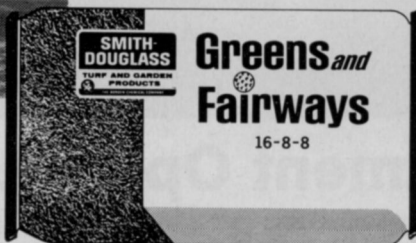
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The extra nitrogen puts green-up energy into tired turf. Phosphorus and potash in plentiful amounts produce thick, uniform turf with a healthy root system. Free-flowing for easy spreading. Easy-to-use 50-lb. bags.

For prices and name of nearest NUTRO distributor, write Smith-Douglass Turf & Garden Products, 5100 Virginia Beach Blvd., Box 419, Norfolk, Va.



Trimmings

New Faces. In these days when good men are hard to find, we're always happy to hear of institutions and associations that have been able to fill posts with qualified appointees. During the past month, news has reached us that Dr. Edgar Beyer has joined the Agronomy Department at the University of Maryland, and Wayne H. Dickson has been appointed Director of Public Relations by the American Association of Nurserymen. Ed Beyer received his M.S. and Ph.D. degrees in plant breeding and genetics at Purdue, and his B.S. degree from the University of Illinois in agricultural science. He'll serve U. of Md. as an assistant professor of agronomy. Wayne has been an editor of a nursery magazine so is well versed in the language of his new assignment. Another Marylander, Wayne received his B.S. degree in public relations from the U. of Md.

* * *

Goof. Our faces are red. One of those "slips that pass in the night" caught us with our cities down. In our February issue, we had an advance story on the International Shade Tree Conference Southern Chapter meeting held at the Andrew Jackson Hotel, but somehow or other we put that hostelry in Memphis. The "Meeting Dates" in that same issue had the correct city, which is, of course, Nashville, Tenn. WTT is proofread four times before it goes to press, but apparently every member of the quartet that goes over the galleys and page proofs missed this double-city reference for the ISTC meeting. Our apologies, and assurances that proofers will be even more exacting in the future.

Also, our printer switched the heading on this column last month so that instead of being our "Trimmings" it came out as "WTT Mailbox"! It never rains but it pours!

* * *

Laconic Legend. Our Circulation Dept. showed us a card just received from Bill Lyons, Lyons Den Golf, Canal Fulton, Ohio, a man of few words, but ones that are mighty sweet to our editors. He writes: "The current (March) issue is worth the year's price. You are outdoing yourself. Keep up the good work. Send a sample copy to my competitor (whose name Bill also sent us)."

* * *

Say That Again! Part of Georgia's statewide "Clean Pastures" program, Phase III, is to wipe out weeds that contaminate animal products and poison livestock. Object of a concerted effort is to eliminate bitterweed which, when eaten by cows, imparts an obnoxious flavor to bovine products. Slogan for the Phase III program is: "Make the Bitter Butter Better; Batter Betsy Bitterweed"! James F. Miller, extension agronomist at the University of Georgia, Athens, tells us 27 north-east Ga. dairy counties battered 63% of their bitterweed with 2,4-D this past year. This is certainly proof that action speaks easier than words.

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The same area twenty-one days after seeding and treating. "Tupersan" made the difference. Note crabgrass growth in the untreated area at right, and how "Tupersan" controlled crabgrass in treated area at left.

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