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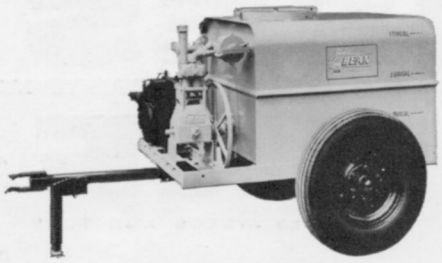

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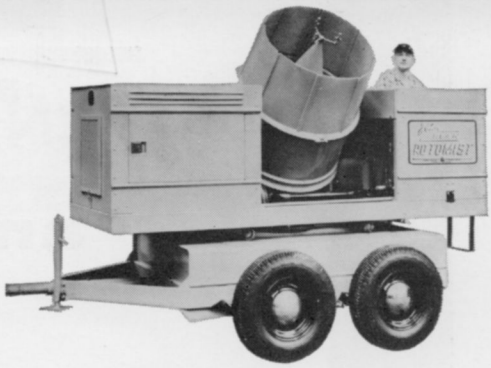

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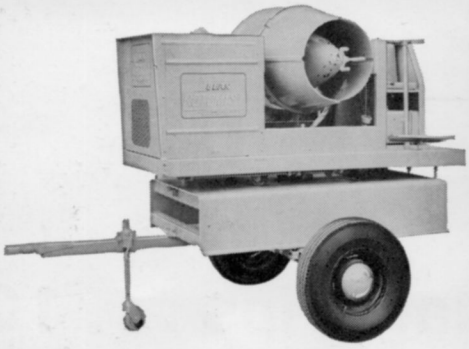

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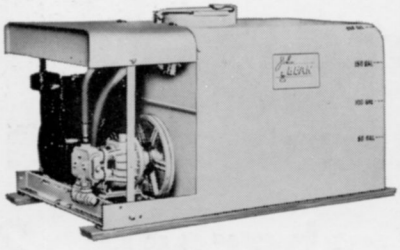

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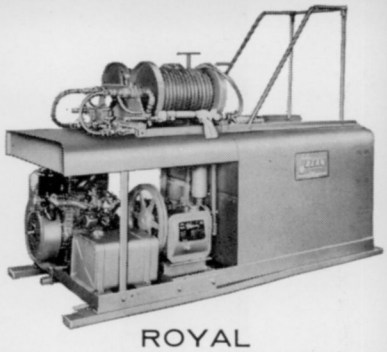

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(continued from front) weed seeds for a full season or longer. ■ With an Amchem roadside weed control program you can just about eliminate the need for mowing and hand-clipping along many roadsides, around trees, sign posts, culverts, under guard rails, fences, etc. Amchem's Amizine or Fenamine herbicides go to work fast and kill a wider spectrum of weeds and grasses—including rough, deep-rooted perennial weeds. The spraying season is extended—spray any time weeds are actively growing. Write for FREE facts on Amchem's roadside vegetation control programs now.

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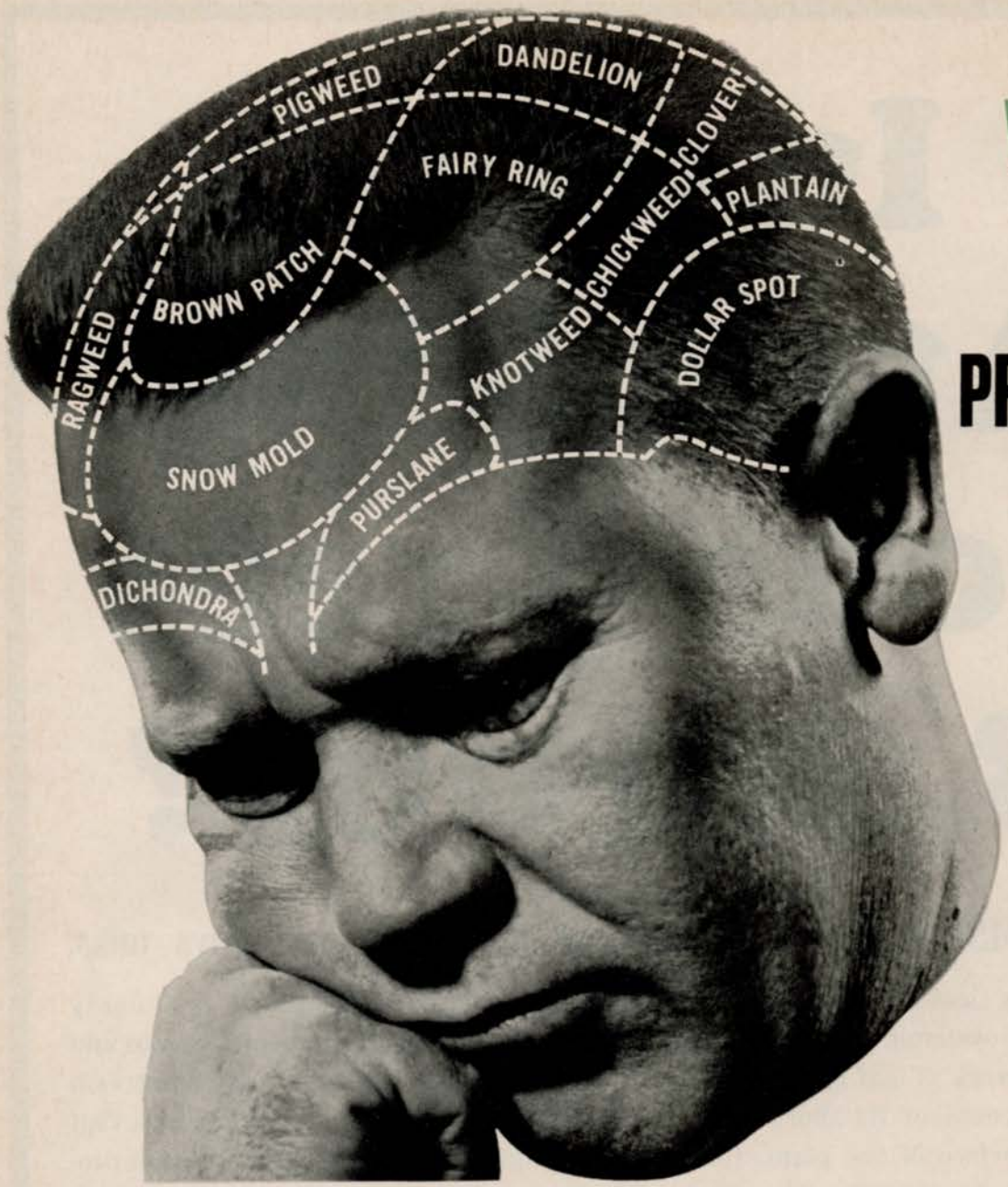

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WEEDS TREES and TURF

FORMERLY WEEDS AND TURF

April 1966

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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."

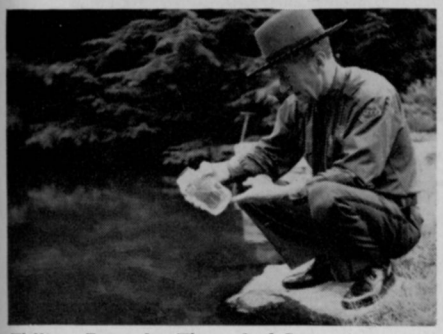
Chartered in 1868 when it operated one reservoir and served a city of 8,714, the Stamford Water Company today operates 4 reservoirs and provides water for 90,000.

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."



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

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

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Control weeds in flowers and ornamentals with

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You can apply EPTAM any time during the growing season to control annual grasses, many broadleaf weeds and nutgrass in flowers, shrubs, ground covers and trees. Simply cultivate out the existing weeds, apply EPTAM, and mix or soak it into the soil with water for safe, economical weed control.

EPTAM controls over 20 species of weeds including annual bluegrass (*poa annua*), barnyard grass, crabgrass, lambsquarters, pigweed, sandbur. It can be used safely on allysum, zinnia and other flowers; on ground covers including ajuga, pachysandra; and on evergreens, deciduous trees and shrubs such as rhododendron and yew. One application usually gives you season-long control.

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Control crabgrass, goosegrass and other grassy annual weeds in lawns and turf

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SELECTIVE HERBICIDE

A single treatment with Stauffer BETASAN selective herbicide controls crabgrass, goosegrass and other annual grassy weeds, and allows the natural beauty of lawns and turfs to come forth.

The best time to use BETASAN for crabgrass and goosegrass is in the spring, before the weeds emerge. This stops early summer infestation and allows the desirable bent, fescue and bluegrass varieties to fill in during their period of most rapid growth.

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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What t

for Industrial Sit

By

DR. DALTON S. HARRISON[1]

Associate Agriculture Engineer
Agriculture Extension Service,
Gainesville, Florida

THERE ARE many variations and types of sprinkler irrigation systems for use on turfgrass; 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 summarized in Table 1 which is based on past experience and retail prices, subject to change.

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

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-

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