Massachusetts Program
(from page 9)

ings are advantageous. In other cases they are hazards creating blind, accident-prone areas.

The Massachusetts program also calls for making maximum use of local, natural growth in the area. Natural growth is not a cure-all, but does have a prominent place in roadside design along with turf and the more sophisticated plantings.

Turf Established
Minimum of 30 feet

Grass is planted for a distance of 30 feet on both sides of all roadways in the state. This produces the necessary sight distance for safety. It also prevents the roadway being shaded and helps in snow and ice control operations. Tree hazards close to road surfaces are also eliminated. Open turf areas on each side of the highway give the feeling of ample width so that motorists make full use of travel lanes. Beasley points out, however, that the 30-foot distance on each side of the roadbed is only a starting point. Fill slopes with guardrails are never planted to grass, but to some low-growing natural growth cover. Turf should never be seeded or laid on cut slopes beyond a point five feet from the toe of the slope, or at a distance greater than can be reached by the cutterbar of a tractor mower. Turf many times is used effectively at distances much greater than 30 feet, usually on fairly level areas. In short, the back line of the turf is not maintained as a straight line parallel with the road surface, but is varied from place to place.

Beyond this turf back line, to the outer limits disturbed by construction, first consideration is in replacing the type of natural growth removed. For example, if pine growth has been removed, the area is designed for use of woody mulch and pine seedlings, spaced about 5 feet on centers. If all survive, salvage thinning is done at a later date.

Plantings such as these increase in value and the roadsides improve in appearance each year. Turf areas are more apt to decline as the years pass.

Beasley's recommendations for planting based on the Massachusetts system call for mass planting of trees and shrubs. Various plantings are drifted into one another. Trees are planted in groves, groups, or clumps to present a natural appearance. Following are what he considers satisfactory locations for planting:

1. Plant as near as possible to location line.
2. On highways with wide layout groups of growing trees, plant halfway between shoulder and location line with taller growing shade trees and evergreens planted in back of or between these groups and the location line.
3. In bowl areas at interchanges, trees are not planted less than 35 feet from the ramp road and not less than 15 feet outside the toe of the slope, so that they will not interfere with sight distance or mowing.
4. Trees are planted and grouped in such a manner that they cause minimum interference with mowing equipment or other maintenance operations and overhead utility lines.
5. Evergreens are planted in checkerboard fashion on abutment slopes and on the fill slopes of interchanges.
6. Trees set out in groups consist of 3 to 5, 7, or 15 of the same species. At interchanges or wide layout areas, 15 or 20 in a group is common.
7. Willow trees are used only in moist locations and far enough back within the layout to allow for their size at full maturity.
8. Gravel pits, dumps, maintenance areas and other such views are screened with evergreens.
9. Unsightly areas which are difficult to mow and not practical to grade and seed are planted with groups of trees or evergreens.
10. Planting of trees at roadside rest areas for shading are given prime consideration.

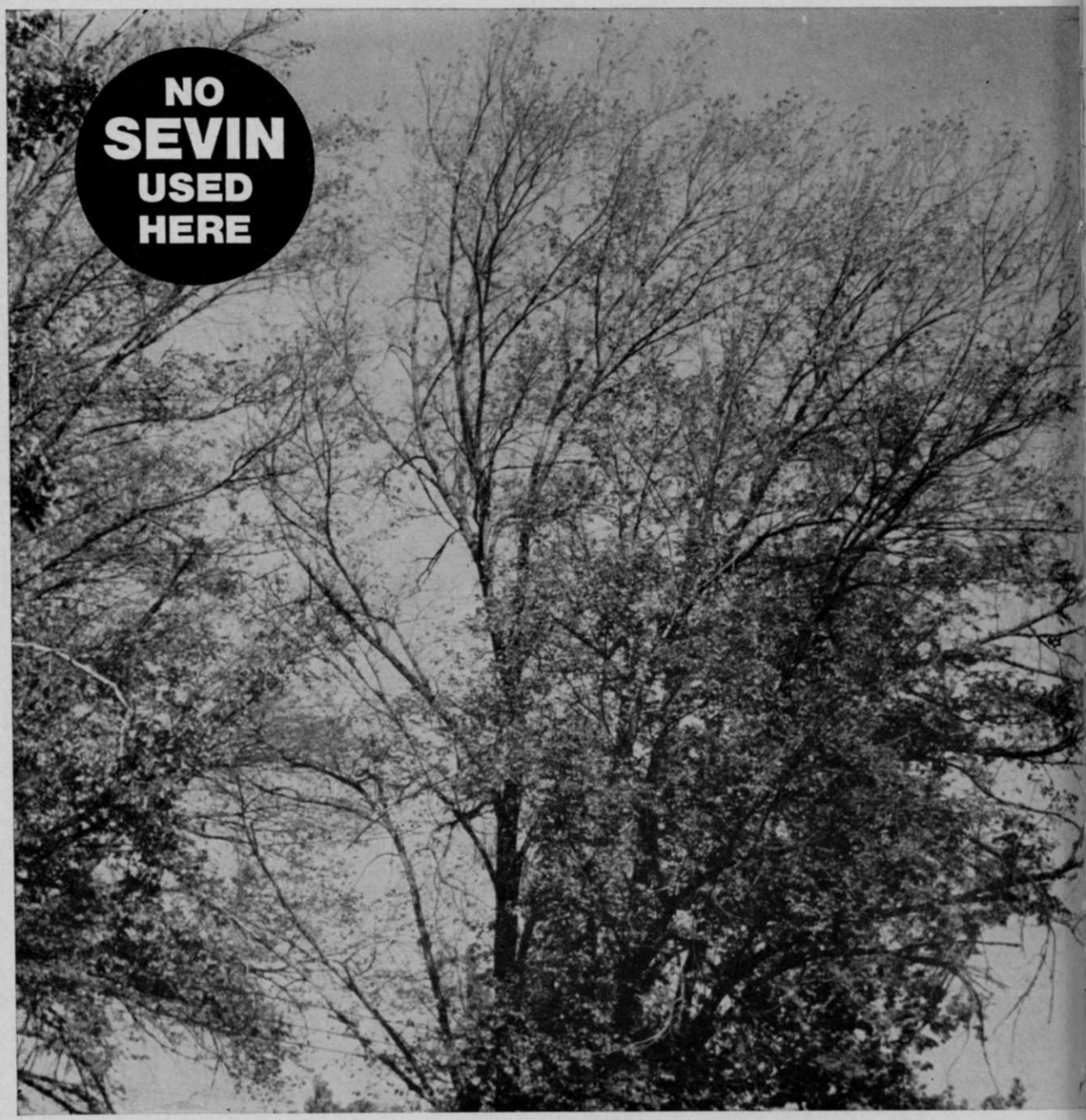
Unsatisfactory locations of tree plantings are important, too, in design and planning. Unsatisfactory spots listed by Beasley are: Under utility wires unless the specie is low growing; in grassed areas between curbing and sidewalk; on the inside of curves where sight distance would be decreased appreciably; in areas close to street intersections at grade or at drives where sight distance would be decreased; less than 12 feet from edge of shoulder on narrow layout highways and less than 35 feet on wide layout or limited access highways; in straight rows or at set distances; in median strips less than 30 feet in width; in open areas within the layout where there is already a suitable background of trees and shrubbery; in dividing strips of ramps; in front of attractive bridge abutments; and where planting may screen vistas or picturesque scenery.

By way of summary, Beasley believes that better roadside turf management can help solve maintenance problems. Further, it is the responsibility of the industry, he feels, to leave a heritage of green and beautiful roadsides for future generations to enjoy.

Massachusetts Plan For Safety and Beauty

1. Recognize that highways are a corridor passing through our countryside—to be improved and protected—for safety and beauty, and for future generations.
2. Salvage construction remnants of land—for small parks or tree plantings.
3. Treat each stretch of highway and each interchange as an individual project.
4. Make maximum use of natural growth in area.
5. Grass first 30 feet alongside highway for safety (and vary the backline of grass).
6. Maintain an awareness that a beautiful highway is a safe highway.
7. Plan planting locations carefully.
8. Continue to develop the policy that careful management helps solve maintenance problems.

The difference is

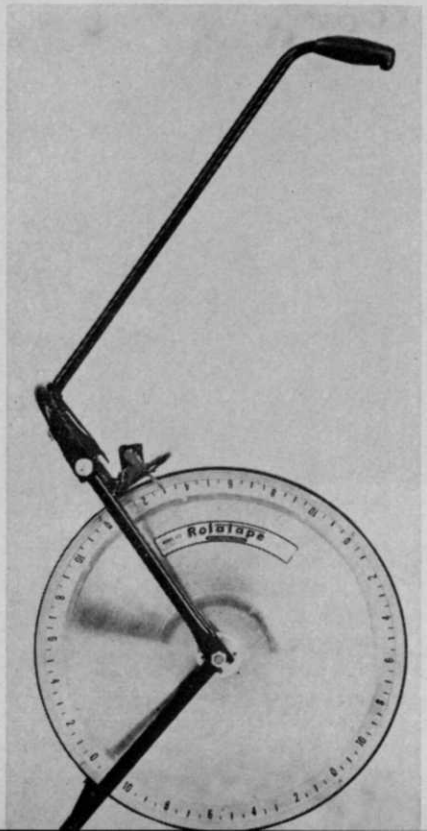


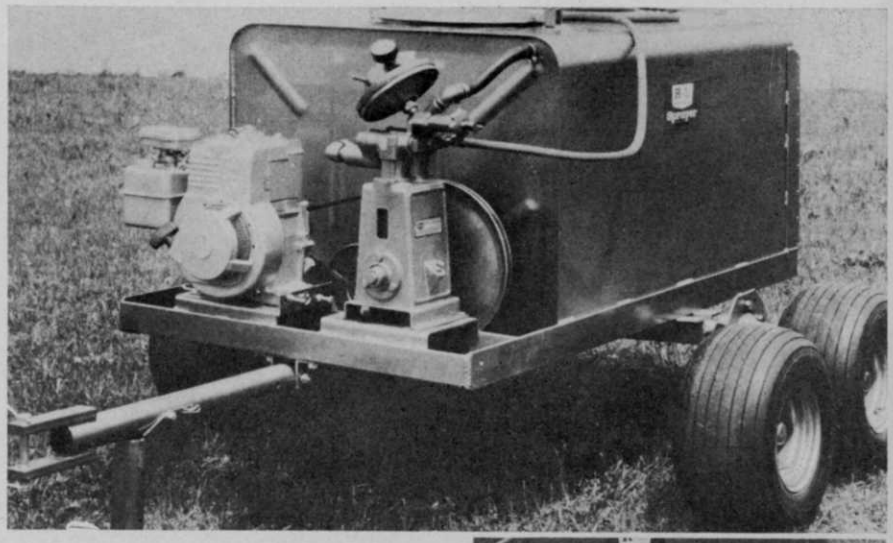
Elm leaf beetles ruined the foliage and damaged the growth of the elm tree, shown above, where no SEVIN was used. But where SEVIN carbaryl insecticide was used to protect the foliage, as shown on the opposite page, the tree stayed healthy, damage-free and attractive. SEVIN provides long-lasting and effective control of major insect pests of trees shrubs, flowers and turf. SEVIN is safer to handl than many other insecticides and its lower toxicit to animals and wild life makes it a wise choice fo insect control on ornamental plantings. For bette insect control, remember ***the difference is SEVIN***

Panorama New Turf Maintenance Equipment

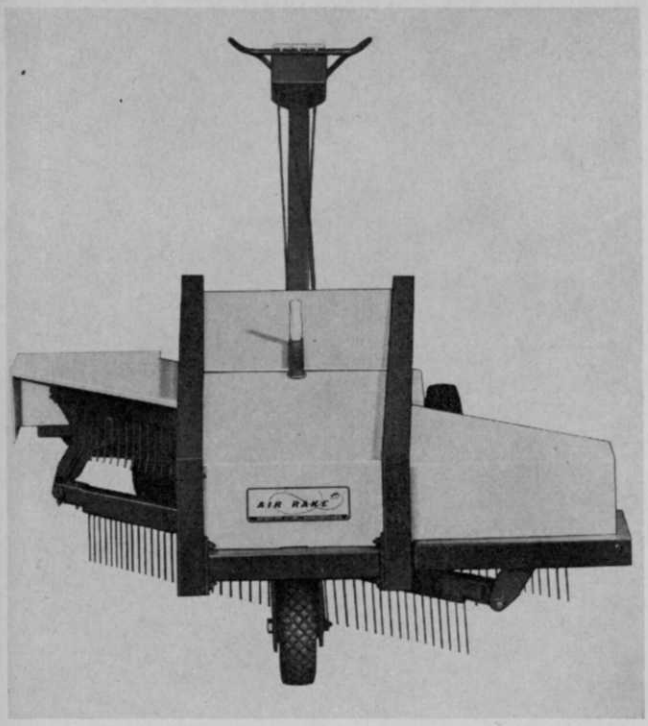
New Turf-Spray attachment for fast and effective spraying of lawns and other ground surfaces has been developed by H. D. Hudson Manufacturing Co. It is designed exclusively for use with the Hudson "Trail-N-Spray" 12½-gallon power sprayer drawn by yard tractors. The attachment has a single broad spray nozzle which sprays weed and crabgrass killers or liquid fertilizers in an even pattern. It is adjustable to spray a swath from 25 inches to 65 inches wide. A flow control lever, operated by the driver, is positioned directly behind the tractor seat. Although the Turf-Spray attachment is easily attached and removed, it may be kept on the sprayer when the operator is using a spray gun. The sprayer can be used with all makes of yard tractors and riding mowers. It is available through authorized Hudson lawn and garden and implement dealers. For further details, write H. D. Hudson Manufacturing Company, 589 E. Illinois St., Chicago, Ill.

Rolatape measuring wheel, below, for uneven terrain is Model 415 from Rolatape Corp., 1301 Olympic Blvd., Santa Monica, Calif. Plated steel disc wheel prevents tall grass or other refuse from interfering with accuracy. Distances to 100,000 feet recorded automatically. Handle folds for transport. Circumference is 4 feet. Weight, 9 pounds. Automatic brake prevents backtracking.

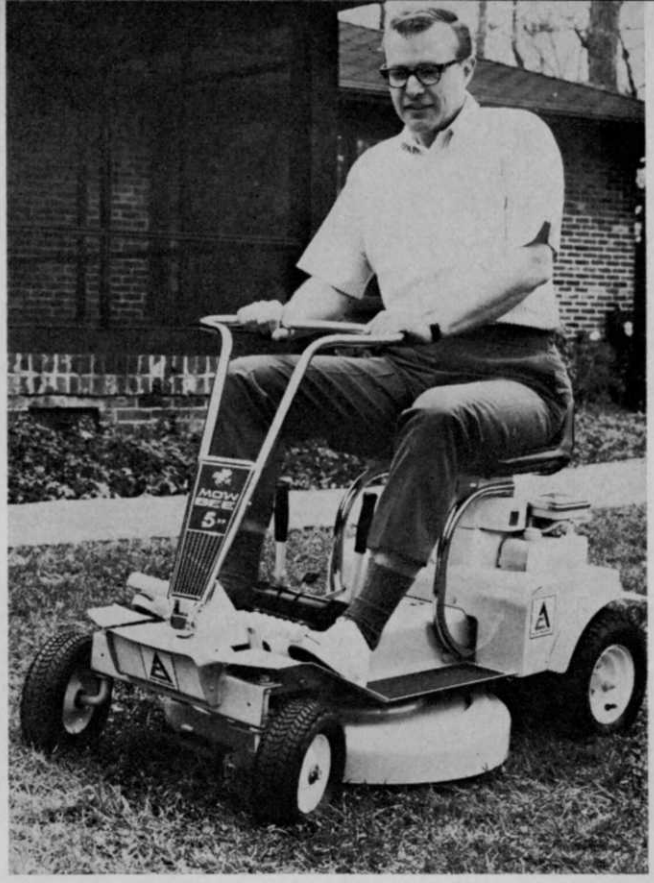




Tire conversion set, above and right, for heavy-duty sprayers in turf maintenance, has been introduced by Root-Lowell Corp. Termed the Turf-Saver Wheel Set No. 1409, it replaces standard wheels and tires when possibility of turf damage exists. Mounting is done with auto bumper jack. Frame bolts direct to axle hub. Two low-pressure tires on each side give wide, soft weight distribution and "floating" action over irregular ground contours. Set consists of 4 wheels with 9:50 x 8 tires and tubes in tandem. Outside diameter is 18 inches. Write Root-Lowell Corp., Dept. WS, Lowell, Mich.



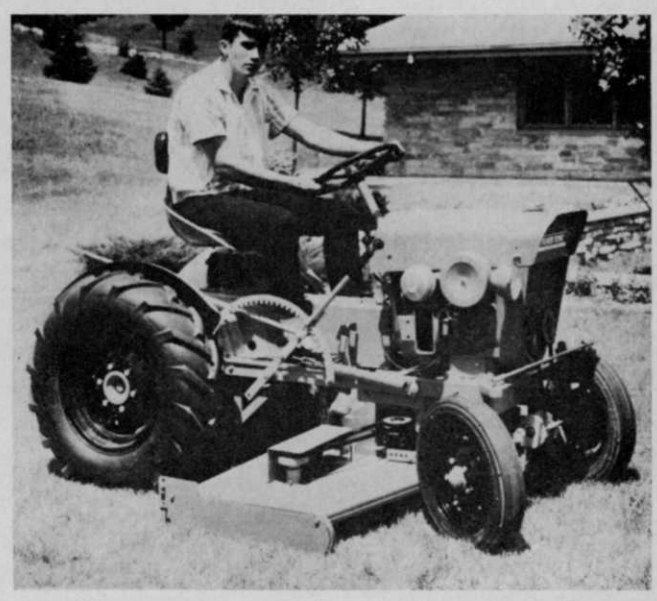
Whirly Rake by Air Rake Manufacturing Co., 41 Jefferson St., Westfield, Mass., patterned after side-delivery rake windrows material. Three comb or rake arms are fitted with wire tines, attached to a rotating hub which drives rake arms in circular motion. Wire tines cover 3-foot surface frontage. Loom-type action rakes leaves, pine needles, acorns, grass clippings and other refuse. Action adjustable for deep down thatching. Available motorized or as pull unit for riding mowers or compact tractors.



New from Allis-Chalmers, Milwaukee, Wis., is versatile, 5-hp MOW-BEE riding mower, above. Powered by 4-cycle Briggs & Stratton vertical shaft engine with spring recoil starter. Five ground speeds, reverse, and on-the-go shifting without clutching. Overall length, 52 inches, width 31¾ inches. Turning radius 32 inches. Five cutting heights, 1½-3½ inches. Automatic brake when drive is disengaged. Grouped control console and swing-away steering tiller.

Self-contained power sprayer with 10- or 20-gallon porcelainized steel tank, above, from John Bean. For weeds, pests and mosquito-infested areas. Trojan sprays 3 gallons per minute at 60 pounds pressure. Self-lubricating, fiberglass pump, located inside tank, has only one moving part. Jet agitation and constant spray pattern. Catalog, S-03, John Bean Div., Tipton, Ind.

Economy tractor, below, handles rotary mowers up to 60 inches. Mows 3 acres per hour. Cutting height adjustment, foot operated clutch for disengaging cutting knives, lift mechanism for raising during travel, heavy cover, and sheave guards. Tractor has 12-hp engine, automotive drive train, welded frame, 16- and 24-inch wheels. Also handles 4-foot dozer blade, ¼-ton front end loader, 36- and 48-inch snow blowers and implements. Write Engineering Products Co., 1005-HF, Anoka Ave., Waukesha, Wis.



Aquatic Weed Control Becomes Technical Operation

Truesdale Lake, N. Y., is one of many lakes cleared of aquatic weeds by Robert E. Sheridan and Sons, Inc. Beginning about 1950, this corporation was established and has worked primarily with northern New Jersey lakes. Excellent results were obtained on Truesdale Lake by use of 2,4,5-T and copper sulfate for weed and algae control.

This special report on aquatic weed control by a leading contractor on the eastern seaboard was prepared for WTT by Douglas G. Bennett, Phelps Dodge Refining Corporation. It is an excellent example of the scientific and technical knowledge and experience needed to serve this field.

EXTENSIVE growth of duckweed in the water adjoining a home, David J. Sheridan says, usually indicates a leaky septic tank in the vicinity. Sheridan, partner with Warner G. Johnson of Robert E. Sheridan and Sons, Inc., Dover, New Jersey, specialists in aquatic weed control, finds himself with so much work both in New Jersey and nearby states that he says, "It's hard to believe that as late as 1950, many northern New Jersey lakes were comparatively clear of aquatic vegetation." However, as lakeside colonies sprang up, wastes poured into lake water, fish populations were depleted, nature's balance was upset and water weeds took over.

In 1950, Sheridan's father, Robert E. Sheridan, Sr., recognizing an increasing need for aquatic weed control, established the company and began working out the aquatic weed control methods which are proving successful in New Jersey and neighboring states.

With a careful study and analysis of problems, Sheridan has constantly refined his methods. He was first to undertake commercial application of the then new aquatic weed control agent, 2,4,5-T, in New Jersey. Previously the Sheridans had excellent results with this chemical on Truesdale Lake in New York State. Use of air boats to apply copper sulfate for algae control is another Sheridan inspiration. Robert E. Sheridan and Sons, Inc., works on most of the major lakes in New Jersey, as well as on bodies of water in neighboring states, operating on the basis of seasonal contracts.

Careful Study Precedes Treatment

Before embarking on the actual work of weed eradication, the firm makes a complete and comprehensive study of the lake to be treated. This includes analysis of water samples taken from a number of locations and depths in the lake, water temperatures, soundings to plot a contour of the lake bottom, samples of the weeds to be destroyed, and current flow. All of these factors are necessary in order to plan correct treatment procedures. Sheridan says, "What will work for one lake will not necessarily be successful on another even though they may be adjoining." These studies also serve as a basis for Sheridan to explain causes of weed growth to clients.

Most privately owned or state-controlled lake communities require septic tanks of approved design and good condition. However, faulty construction or ground movement due to frost or settling sometimes causes leaks in a system. Sewage can then seep underground into a lake where the released nutrients nourish a crop of undesirable weeds. Sheridan has noted over the years that an extensive growth of duckweed in the water adjoining a home is a strong indication that sewage is leaking into the lake. Sheridan explains such a situation to the property owner, giving the owner an opportunity to take corrective

measures, thus cutting down the nutrient level of the water and the incidence of weed propagation.

Sheridan cites two examples why more and more lakes are experiencing weed problems. One is White Lake in New Jersey. When this private lake was developed in 1940, water was clear and free of weeds and algae. As homesites surrounding the lake were developed and occupied, nutrient content of the water rose because more sewage found its way into the lake. Resulting weed growth over the years then impaired use of the lake for swimming, boating, and fishing. Since value of lakeside property is directly in proportion to use of the water and esthetic values of scenic beauty, unsightly and odoriferous weeds which restrict activities on the lake tend to reduce property values. This is a strong incentive for the governing bodies of lake communities to take corrective action. Another reason for the rising incidence of weed growth is increasing popularity of outboard motor boats.

"Boats play an important role in infecting lakes with weeds by spreading the seeds," says Dave Sheridan. "People used to keep their boats on the lake where they had their homes. Now, with the ease of loading on trailers, many people who do not live near the water own boats and haul them to whatever lake they desire. Weed seeds are transported from lake to lake in this manner since they will adhere to the hull, even though the boat is dried out between weekends. Thus, in the course of one season, a large number of lakes can be infected."

Equipment Must Fit the Job

Once the initial survey work is completed and the company receives the go-ahead, equipment is moved onto the lake and treatment started. Because physical conditions and requirements vary from job to job, today's applicator must not only have standard boats, tanks, and pumps at his disposal, but also must be adept at designing and constructing special chemical-dispensing equipment that may be required to meet unique situations. Sheridan uses any one of three air boats of 100, 103 and 125 hp with varying capacities, as dictated by the density of the weeds, depth of the lake, and the amount of material to be carried. He has found that with the variety of chemicals used, a mixing tank of Type 316 stainless steel and brass boom jets are the most satisfactory.

Sheridan's initial use of air boats was a result of a contract to treat the lakes at the New York World's Fair in 1963 and '64. The lakes, situated within the exhibition area, were subject to extensive, unsightly growths of weeds and algae. Because these lakes were shallow (four to six feet) and had a soft layer of sediment on the bottom, use of an outboard-driven boat to dispense copper sulfate was impractical. Test runs had shown that the outboard caused underwater turbulence to the point that the copper sulfate was being absorbed into the sediment instead of going into solution with sufficient residual to destroy the algae.

Other problems specific to these lakes were also encountered:

1. Because considerable amounts of nutrients necessitated frequent applications, equipment had to have a great deal of mobility.

2. Dependability and mobility were essential because of limited application time available. Since the Fair opened to the public at 10 a.m. daily, application had to be concluded by then. Thus, a system capable of efficient use of available time, with the potential of counteracting any extenuating circumstance, had to be provided.

3. Due to the ease with which bottom sediment was disturbed, some method of propulsion, eliminating turbulence, had to be worked out. At the same time, the shallow depth required the elimination of any projection below the boat.

4. Turbulence would also decrease the residual copper after application, since the copper sulfate would tie up with this agitated material, reducing the action on the algae and necessitating increased dosages to arrive at desired results.

5. As a result of the increased dosage required, the problem of providing adequate protection of the fish population arose.

6. The last major factor involved was the unusually high alkalinity found in the World's Fair lakes which compounded the dosage problem.

After considerable study of the situation, and based upon

Lake, right, is typical of many in area served by Sheridan corporation. Algae and weed problems are carefully studied prior to treatment. Treatments to solve specific problems may vary even though lakes are located in adjoining areas.

previous experience, Sheridan decided on the use of an air boat as the most practical means of applying copper sulfate as an algaecide. The following results substantiated this decision:

1. Mobility was solved by providing a system that was self-contained, easily transferable and ready for use without extensive preparation. This proved to be the air boat.

2. The time factor was solved by providing a system that allowed for varying speeds, patterns, and solutions. The speed of the air boat can be regulated with a great degree of precision up to 25 miles per hour. The spray pattern, through the use of boom jets, allows a variation in width up to sixty feet with instant control of the pattern on either side of the boat. The chemical solution can be controlled in the mixing tanks by adjusting a simple regulating valve and through the use of a flow meter. The quantity of liquid in the tanks is further regulated by a float valve.

3. Projections extending below the boat and turbulence by underwater propulsion were eliminated through the use of the aircraft motor and propeller.

4. The loss of copper sulfate by absorption into bottom sediment was also solved by removing the source of turbulence; that is, the underwater propulsion.

5. Greater protection was afforded to the fish population because less algaecide was now required to achieve the desired residual of copper in the water. Further protection was provided by applying copper sulfate to the lakes in sections; the first and second sections to be treated being on the opposite ends of the lake.

6. The problem of high alkalinity was solved by recognizing the diurnal characteristics of alkalinity in water and providing for application early in the morning when the pH was still fairly low.

Comparison of Lake Treating Methods

	Old Method	New Method
1. Method of application	standard	spray
2. Propulsion	outboard motor	air motor
3. Agitation of bottom deposits	substantial	minor
4. Pounds of copper applied	14,350	11,300
5. Total cost	$2,858.00	$2,422.00
6. Residual copper after 24 hrs. as CU++, MG/1	(1) 0.83 (2) 0.69	(1) 1.00 (2) 1.08
7. Residual copper after 94 hrs. as CU++, MG/1*	(1) 0.33 (2) 0.21	(1) 0.56 (2) 0.66

*milligrams per liter as copper

The interrelationship of the above factors can be readily seen since the solution of one problem generally facilitated the solution of another. The control provided by this new method can be graphically illustrated by comparing tests in the accompanying table made with the standard procedures and the new method of application on the lakes.

Several important factors may be determined by figures in the preceding table. By using spray application with an air motor, the initial dosage of copper can be decreased while still achieving the same desired result. Therefore, the initial cost of chemical can be much less. Secondly, by eliminating the agitation of bottom sediment, coupled with the spray methods, the residual copper found in the water was greater and persisted at a higher concentration for a longer period of time.

Thus, by providing a flexible system with a new method of application, the major factors preventing normal methods of adequate control were eliminated and increased effectiveness was provided at reduced cost.

An entirely different situation was encountered in treating the lakes on the estate of Doris Duke, Hillsborough, N.J. The

Lakes within exhibition area of recent New York World's Fair were subject to extensive growth of weeds and algae. Sheridan turned to air boats to avoid turbulence in shallow lakes. Copper sulfate was ejected to rear and on both sides of propeller. Spray covered almost 60 feet on each side of unit.

eleven lakes had been designed, as part of the landscaping of the estate, to flow into one another. When Sheridan was called in, the weeds had grown to a point where they were not only unsightly but were clogging the outlets. This prevented free flow of water from lake to lake. Since the lakes were stocked with game fish, extreme care had to be used to insure that chemicals introduced to the upper lakes did not become concentrated in the lower lake to the point of toxicity to fish and other aquatic life. At the same time, the streams connecting the lakes had to be freed of weeds to permit water flow through the entire chain. The program undertaken by Sheridan required 4 years before all the lakes were completely weedless. Once this was the case, periodic treatments have kept the weeds at a minimum and no problems have occurred that required intensified or drastic measures.

The Truesdale Lake was ringed with summer homes and was a popular watering spot until it became choked with weeds. Weed growth virtually ruled out swiming, boating, and fishing. Members of the Truesdale Lake Property Owners Association faced decreasing fun and declining property values. Something had to be done.

Scuba gear for underwater research prior to recommending aquatic weed and algae control are standard procedures. Demonstrating equipment and method, left, is David J. Sheridan.

Necessary arrangements were made with the City and State of New York to treat the lake during the summer of 1961. Since the lake is part of the watershed serving New York City, special arrangements were made to measure chemical concentrations in the water.

This program was conducted under the general supervision of Dr. E. C. Raney, Professor of Fisheries, Biology and Zoology, Cornell University, with assistance from Roy R. Younger, New Jersey Department of Conservation. Sheridan was engaged to undertake the treatment.

A mixture of 2,4,5-T and water was applied as a coarse spray over the surface of the lake. The chemical formed a white emulsion in the water, persisting for about 20 minutes and eliminating the need for marker buoys. This chemical is effective in controlling some of the most obnoxious aquatic weeds when as little as two parts per million are applied in lake water.

The operation produced no adverse effects. Kill of fish was minor. This seems almost inevitable in aquatic vegetation control work since decaying vegetation ties up oxygen in the water. However, 2,4,5-T kills aquatic plants gradually, keeping this problem at a minimum.

Restrictions Common For Municipal Systems

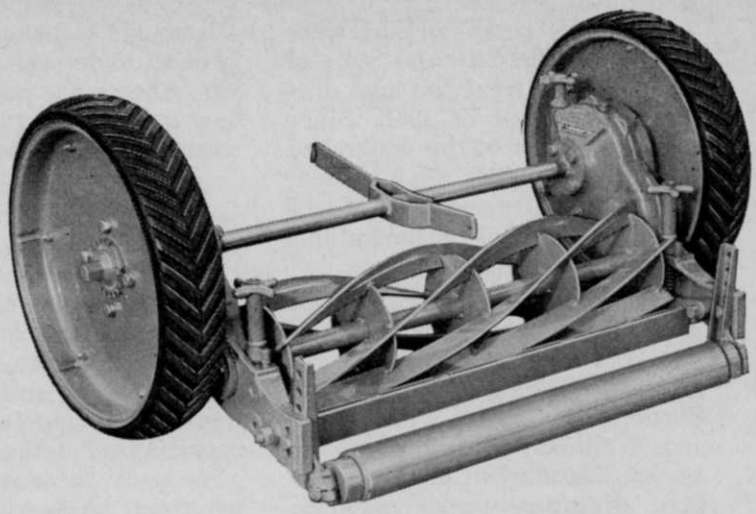
There are many occasions when chemical weed control is restricted in treatment of lakes on the watershed of municipal water systems. Water companies are extremely careful about use of chemicals when there is a possibility that the chemical residual may leach to the reservoir system or be carried into it by streams flowing from lakes in the watershed. When Sheridan encounters such a restriction, sheets of black plastic 100′ x 40′ are spread over the lake bottom and held in place with sandbags. Within 14 days all aquatic growth under the sheet is killed off. Sheets are perforated to allow gases caused by the decomposing weeds to escape.

Algae control is also an important facet of Sheridan's work since decaying weeds following treatment can result in an increase of algae. When the company contracts to treat a section or an entire lake, algae control with copper sulfate is recommended. Obviously the company cannot predict the extent of algae growth nor guarantee against it. As part of their service, Sheridan takes periodic tests of water for algae and also bacteria. If count is on the rise and general conditions are conducive to algae and bacterial growth, Sheridan recommends copper sulfate treatment. "Correct timing is of utmost importance when treating, to maintain a balanced water condition. It's just like the cultivation of roses or any other plant," says partner and biologist, Warner G. Johnson.

Sheridan does its own water analysis and also sends samples to established commercial and state labs for cross-checks. This helps insure correct analyses and also protects the company against claims rising from destruction of fish or any conditions which may have started prior to treatment. Tendency is to blame the applicator and chemicals used, regardless of who or what may be at fault.

In addition to work in aquatic weed control, Robert E. Sheridan and Sons, Inc., applies flocculants such as aluminum sulfate to any body of water where there is a large amount of suspended dirt or mud. Such situations are often the result of heavy rains, floods, or construction work where excavated dirt has been swept or blown into the water.

With the continuing increase and interest in development of lakeside communities and creation of private ponds, Sheridan and other algae and aquatic weed control specialists can look forward to a growing demand for their specialized services.

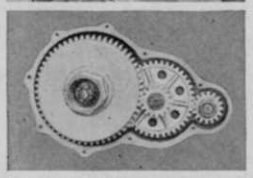


Jacobsen 6-blade Fairway mower. Also available in a high frequency 10-blade model specifically for super fine fairways.

More *Mow*bility features! ...the Jacobsen Fairway Gang Mower

A close examination and comparison of the Jacobsen Fairway mowing unit reveals the reasons for its reputation for superior performance, trouble-free operation and minimum maintenance requirements. These units embody famous Jacobsen features that make Fairway units preferred on fine courses. One-point lubrication requires attention just once a year.

Positive clutch quickly engages and disengages revolving knives with the turn of the knob at the top of each gear housing.



Separate gear drive for each wheel. Both housings contain separate trains of precision, machine-cut gears for better driving efficiency and proper balance. Housings are completely sealed.

Quick adjustment of bed knife is made without tools. A simple turn of the hand knob gives positive adjustment. Friction lock holds adjustment. Bed knife is of special long-wearing alloy hardened steel, with double lip edge.

Every component of the Fairway mower is designed to meet the highest standards of performance, from high frequency of cut to rugged, long-life operation. Why not see it perform, for yourself, on your course? Without obligation, call your distributor for an action demonstration. Jacobsen Manufacturing Company, Racine, Wisconsin.

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