√☒ New Ways to Appl

INCREASING water consumption, engendered by the population and industrial growth of the United States, has presented water managers with many problems in obtaining a product of the highest purity.

Not the least of these is the constant battle against microscopic organisms manifested in the various forms of algae, whose presence can give water a distinctively unpleasant fishy taste and odor. While taste and odor are not of prime importance to industry, pumps, boiler tubes, filters, etc., can be clogged by algae, leading to expensive shutdown of equipment. In the manufacture of inks, dyes, paper, and in photographic processing, the presence of algae can cause an end product not up to acceptable industry standards. And many contract applicators wage constant war on algae in private lakes, ponds, marinas, etc.

The use of copper sulfate as an algicide is standard practice. However the method of applying the chemical is varied and reflects local conditions and requirements.

While the dragging of a burlap sack filled with copper sulfate crystals behind a rowboat is still being used, labor costs have dictated more efficient procedures.

The Phelps Dodge Refining Corporation Information Service, as part of its program of providing data pertinent to water

A 100-lb. bag of large copper sulfate crystals is fed into bronze-screen hopper by this workman for the Seattle Water Department. Two-point pivot mounting allows hopper to ride up should it strike underwater objects or shallows.

treatment, has been in contact with water management personnel throughout the U.S. regarding the types of application equipment employed. Some of these methods will be of interest to those charged with algae control.

WTT readers may obtain detailed drawings and specifications of the equipment described in this survey through the Information Service, 300 Park Avenue, New York 22, N. Y.

Blower System

One method, for example, is used on occasions where it is desirable to *blow* a chemical dust rather than use a slurry or solution. The Helix Irrigation District of La Mesa, California, uses such a system.

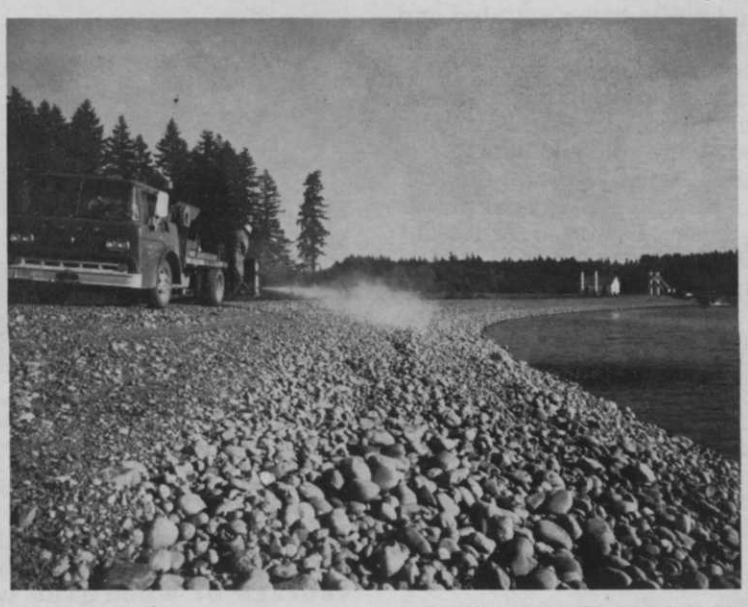
The principal advantage of the blower-type machine is the ability to treat large surface areas rapidly with a light dosing of material. Another advantage is the breaking down of crystals in the blower to a fine dust.

The blower operates from 3,000 to 3,500 rpm, which has the tendency to grind the commercial-grade $CuSO_4$ snow into smaller particles. These small particles are blown into the air, and wind currents assist in spreading them over the surface of the water.

Certain disadvantages are found in the blower-type machines. For example, the larger machines are heavy enough to reduce the permissive load of chemical in the boat; and two or more men are required to transport the units in and out of the watercraft. The machines also need continual adjustment by a trained operator, such as a contract applicator, to maintain a constant feed and to obtain an even distribution of copper. An excessive rate of feed may clog the discharge spout. Use of these blower-type machines is dependent upon the wind for distribution of chemical, and with shifting winds the boat crew as well as the reservoir may be dusted with the material. There is always the loss of varying amounts of copper sulfate dust that is carried away by the wind and then settles upon the above-water shoreline of the reservoir.

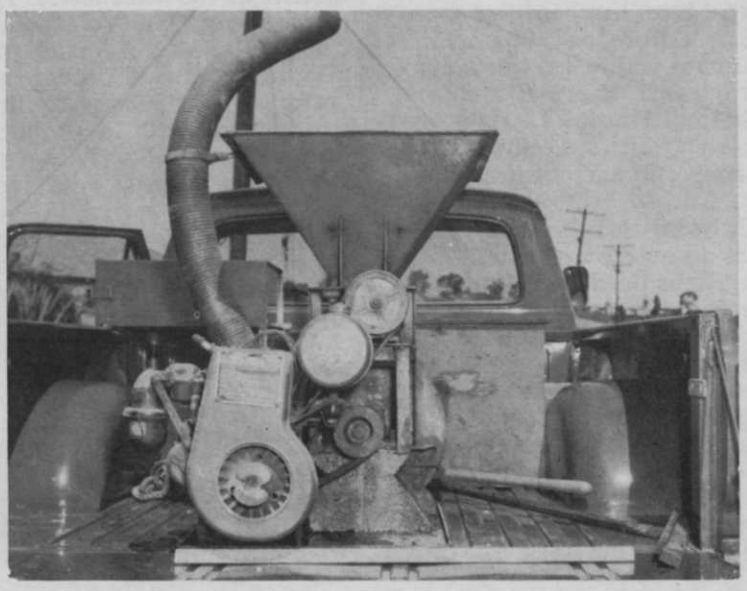
The calm, nearly perfect day is far from ideal for this type of water treatment. It means a much lighter feed of copper sulfate and much closer treatment lanes which require a considerably longer time to cover the given area. Optimum weather conditions consist of light winds of 10 to 15 mph blowing steadily from one direction. This permits a higher rate of copper sulfate feed, and a marked increase in the width of the treatment lanes, thus decreasing the total time of treatment considerably. An area of 1,804 acres can be treated under favorable conditions in 4½ to 5 hours with 5 tons of the algicide. On a calm day, treatment would require from 10 to 12 hours for completion. Reservoir treatments should be com-

(Continued on page 24)

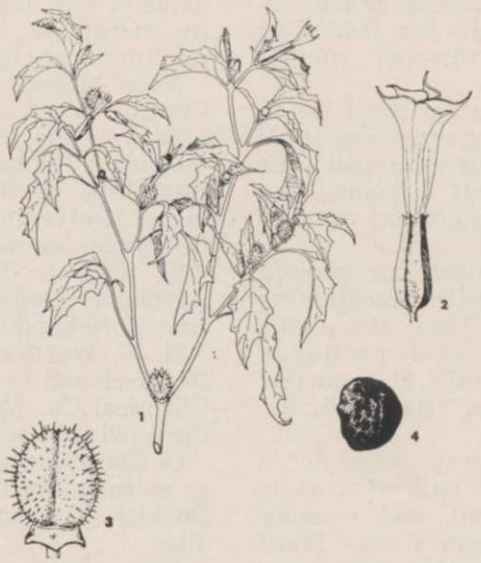


This blower dispenses copper sulfate for the Helix Irrigation District of La Mesa, California.

Blowers for dispersing aquatic herbicides and algicides can also be mounted on trucks, as is this machine used for treating the Seattle Water Department Reservoirs.



JIMSON WEED
(Datura stramonium)



Jimson weed is an annual, reproducing by seeds, which is variously known as Jamestown weed, stinkwort, thornapple, and trumpetplant. It is widespread across the United States and southern Canada, but is more troublesome in southern North America. It was introduced from South America as an ornamental.

Jimson weed is found on silty or gravelly soils in low areas, fields, and waste places such as dumping grounds.

Stems (1) grow 2 to 4 feet tall. They are smooth, stout, and widely branching. Leaves are oval, with shallow, irregularly toothed margins. Leaves occur alternately on thick stems. They have a distinct foul odor.

Flowers (2) are large, either white or purplish, funnel (trumpet)-shaped and 2 to 5 inches long. They are borne singly in the axils (junctures) of leaves.

After flowering, the unique seed pod (3) develops. It is ovoid with a crease extending from the base over the end and down the other side. The pod is covered with short, sharp spines. It measures about 1 inch in diameter. Many dark-brown seeds (4) contained in four sections of the pods, are circular, flat, and wrinkled. Seeds are permitted to fall when autumn dryness causes the pod to curl back along the crease and release the seeds.

Roots are thick and fleshy, very much branched, and shallow.

There are two related southwestern species: the desert thornapple, *Datura discolor,* and the sacred datura, *D. meteloides,* which are readily distinguished as *Datura* spp. by the funnel-shaped flowers or the spiny seed pod, but these species differ in size and coloration.

All *Datura* spp. are members of the Nightshade family, Solanaceae, renowned for members which possess poisonous properties.

All parts of the jimson weed plant are poisonous when eaten by man or animals. Some sensitive individuals contract dermatitis (skin rash) when they touch jimson weed.

Jimson weed is easily controlled with 2,4-D or 2,4,5-T. Many seeds of this weed which lie dormant in the soil necessitate continuous controls with these herbicides year after year for several seasons before complete control is achieved. Of course, jimson weed is vulnerable to soil sterilants.

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)

New Ways to Apply Aquatic Herbicides

(from page 19)

pleted in one continuous operation. A layoff of even a few hours may result in the shifting of water to such an extent that some areas may be undertreated, with a resulting decrease in effectiveness of treatment — or, may be overtreated with resulting hazards to fish life.

The blower-type machines are of various sizes and weights, but basically they are all of the same construction pattern: (1) a hopper with sloping sides holding 130 to 170 lbs. of material; (2) an agitator just above the bottom of the hopper having a speed of from 15 to 30 rpm; (3) an adjustable orifice to feed from 5 to 60 lbs. per minute; (4) gas engines, 2½ to 6 hp at 3,500 rpm; (5) 14″ to 16″ blowers directly connected or V-belt driven, with chemical fed directly into the suction port and 4″ to 7″ outlet spout for dispersion; (6) a light frame to support counter shafts and hopper speed reducer. The total weight of the unit will vary from 250 lbs. to 450 lbs., depending upon the size and type of material used.

The cost will naturally vary depending on the size, equipment, and personnel available for fabrication. The engineering department of Helix estimates approximately 50 hours of time and a total cost in the neighborhood of $1,000.00.

Screenhopper—Power Boat

To quickly and efficiently treat not only the 725 acres but also the seven-mile shoreline of their primary storage reservoir, the Seattle Water Department has designed and built two specialized pieces of distributing equipment. For the treatment of the reservoir itself a large, bronze, mesh-screened hopper was constructed.

The screen has a ¼″ mesh and is supported on a framework of extruded steel angle stock. Two-point pivot mounting permits flexibility and prevents damage

in the event it is grounded in shallows or shoreline areas.

The mounting is designed to place the hopper directly in the agitation created by the boat propeller to provide rapid dissolving of the algicide. Special chutes have been installed to facilitate filling the hopper from 100-pound sacks stored aboard the boat.

The hopper was constructed in the Water Department shop and required approximately 48 man-hours. Total cost was approximately $325.00.

Two men are required to operate the boat and fill the hopper. A set of material-handling conveyor tracks are used for unloading the truck. The cost of the conveyor tracks was approximately $100.00.

Another piece of special equipment devised by Water Department personnel is a steel hopper and blower for application of small crystal copper sulfate. This hopper was also built in the Water Department shop at a total cost of $200.00 and required two days to fabricate. This hopper is temporarily suspended from the bed of a truck carrying a skid-mounted compressor.

This device is used to apply chemicals to the 7-mile shoreline of the primary storage reservoir at Lake Youngs and the 1-mile shoreline of the Tolt Regulating Reservoir.

Two men can operate the equipment with one man driving the truck and one man attending the feeding of copper sulfate into the hopper. The coverage is very uniform and is rapidly applied. The speed of travel of the truck is the gauge used in determining the dosage applied.

This is the first of two articles on equipment available to contract applicators and others for application of chemicals to aquatic areas. Part II will appear in the April issue. —Ed.

Bo-Rid Soil Sterilant in New Dry Form, Says Bogle

Bo-Rid soil sterilant weed and grass killer formulations are now appearing in a new, dry-pellet form, reports the R. H. Bogle Co., Alexandria, Va.

In its new form the layered configuration flows out as a white granular grit, easy to see and handle, the company says. The pellets hug the ground. Ground moisture works slowly to dissolve the pellet layer upon layer, providing a long-lasting action for increased effectiveness.

Specifications describe the three main formulations: Bo-Rid 20H for initial kill of heavy problem vegetation; 20K for follow-up of pretreated areas or medium vegetation control; and 10H-15K for general weed and grass control in southern areas.

Data sheets covering these three formulations are available to interested readers who write to R. H. Bogle Co., Alexandria, Va.