"The carrying strap of a portable burner should never be slung over the head but hung on the shoulder next to the tank so that it can be removed quickly. The pump should be used frequently to maintain a satisfactory pressure in the tank, but the pressure should never be higher than designated by the manufacturer.

"Goggles and hats or caps, as recommended in the Department of Labor Standards 1910 Subpart I - Personal Protective Equipments, shall be worn during all weed-burning operations. Oily or greasy clothing shall not be worn."

These instructions are noteworthy and should be followed by all irrigation districts that have a weed burning program.

Mechanical Equipment for the Control of Land Weeds

Various types of mechanical equipment have been used in the control of land weeds. Some equipment is relatively simple and inexpensive; other equipment is complex and costly. Some newer machines, such as mowers and shredders, are now on the market. Many of these accomplish a great deal of work in a short time.

Until very recently, farm-type equipment fulfilled the needs of most projects, although in some instances, inefficiently. Mowers, brush cutters, drags, disks, and other special pieces of equipment to accomplish a particular job are included in the list of mechanical equipment used by various organizations and agencies in the control of land weeds. New equipment now available commercially has contributed to increased efficiency and made it possible to do work previously accomplished only at very high cost.

Mowers. - Mowing of irrigation ditches for the control of weedy grasses and plants may often be necessary. Mowing equipment used on irrigation ditches has primarily been adapted from mowers designed for mowing on smooth terrain. Mowing of annual weeds for control can be carried on continually but should be accomplished before seed production. Woody plants usually can be adequately controlled by annual mowings. Grassy plants, such as Johnson grass, require mowing at about 2- to 3-week intervals to adequately preclude interfering growths.

Mowers that shred and throw the debris to the top of the ditchbank are preferred to those that let the debris fall within the prism of the ditch.

On many projects, wheel-type farm tractors with hydraulic and mechanical control of conventional cutter bars are used in maintaining canals and laterals. Similar type heavy-duty equipment is also available commercially. One commercially available mower, shown in figure 79, is completely hydraulically operated.

Figure 79

The cutter bar is extendable and retractable. The cutting of phreatophyte fringe growths along canals and drains in the Southwest requires a more durable machine than one for grass cutting. The cutter is designed to mow plants up to 3 inches in diameter.

The Middle Rio Grande project has acquired a machine of this type and mounted it on a crawler-type tractor. With the cutter bar in a partially raised position, obstacles and structures can be easily cleared.

To use mower tractors and operators in the most efficient manner, personnel of the Tucumcari project in New Mexico placed a 7-foot *sickle cutter bar* on the side of one tractor already equipped with a three-rotor, 8-foot-cut, rotary mower mounted on the rear. One machine was thus able to cut a 15-foot swath, clearing the operating road and one bank of a lateral in a single operation, as shown in figure 80.

Figure 80

The side-mounted sickle cutter bar is driven by a hydraulic motor, while the rotary mower is driven from the tractor power takeoff. The machine operates very smoothly and covers a large area of ditchbank in a short time. Both the rotary mower and the hydraulically driven sickle mower are available commercially.

A somewhat more elaborate *rotary mower* is shown in figures 81 and 82. This three-section, 15-foot, SMC Mowal Model TK is used on the Rio Grande project in Texas. Pulled by a wheeled tractor, the commercial mower is used to good advantage in clearing wider areas with one pass. The outer sections of the mower are hinged and can be raised or lowered hydraulically. Power for operation of the mower is furnished by the tractor shown towing the mower.

A similar mower used on the same project is shown in figure 83. This Mowall Model brush cutter is shown cutting weeds on one of the Rio Grande project laterals in the vicinity of Ysleta, Tex.

The *Chem-cut mower* shown in figure 84 is used on the Pecos River Basin Water Salvage project, N. Mex., for the treatment of saltcedar regrowth. The machine uses a rotary cutting blade with a rotating boom attached to the underside of the blade to cut and spray an 84-inch-wide swath. This unit is equipped with two 150-gallon fiberglass saddle tanks and a 24-gallon tank located on the mower.

Figure 81

Figure 82

Figure 83

Figure 84

Figure 85 shows a Ford 5000 tractor with dual wheels and an *84-inch rotary mower* cutting saltcedar regrowth along the Pecos River east of Roswell, N. Mex. Industrial wheel tractors and heavy-duty 84-inch mowers are used extensively for the control of saltcedar regrowth. The tractor is equipped with steel-reinforced, dual-wheel tires for flotation. This equipment will effectively mow woody plant regrowth from 1 to 1-1/2 inches in diameter. Under average conditions, the mower can cover from 2 to 3 acres per hour of operation.

Slope mowers are used on many projects to control vegetation on canal banks and steep slopes. The slope mower shown in figure 86 is mowing grasses and weeds on the Taylor Lateral near Las Cruces, N. Mex.

Figures 87 and 88 depict a mower used on the Central Valley project, Calif. This Houston Ashtron mower is mounted on a Farm Model 4400 tractor and is powered hydraulically. This slope mower is equipped with a flail cutting head. A closeup view of this head is shown in figure 89. Figure 90 shows a rotary cutting head that is interchangeable with the flail heads shown in the previous figures. This mower does an excellent job of cutting grasses and weeds from the operating road to the waterline. It has also been used on steep slopes in other areas where conventional mowers cannot operate.

A number of other slope mowers are commercially available and if a district is interested, local equipment dealers should be contacted for information. The *slope runner mower* shown in figure 91 is manufactured by Slope Tractor, Inc., Harper, Kans., and will operate on slopes up to 30° from the horizontal. Through hydraulic controls from the operator's seat, the body of the tractor and the wheels remain level and the mower and the axles of the tractor slope to conform to the terrain. The mower consists of a 6-foot-wide, three-blade rotary mower with side guards. The mower can be hydraulically raised and lowered, through cutting heights ranging from 1 to 10 inches, by operating a lever on the tractor's control panel. The mower is mounted underneath the tractor and mounted from the rear axle. It automatically follows the inclination of the rear axle, assuring the operator that the mower blade is parallel to the surface being mowed. An accessory is also available which automatically maintains the tractor in a vertical position.

Figure 85

Figure 86

Figure 87

Figure 88

Figure 89

Figure 90

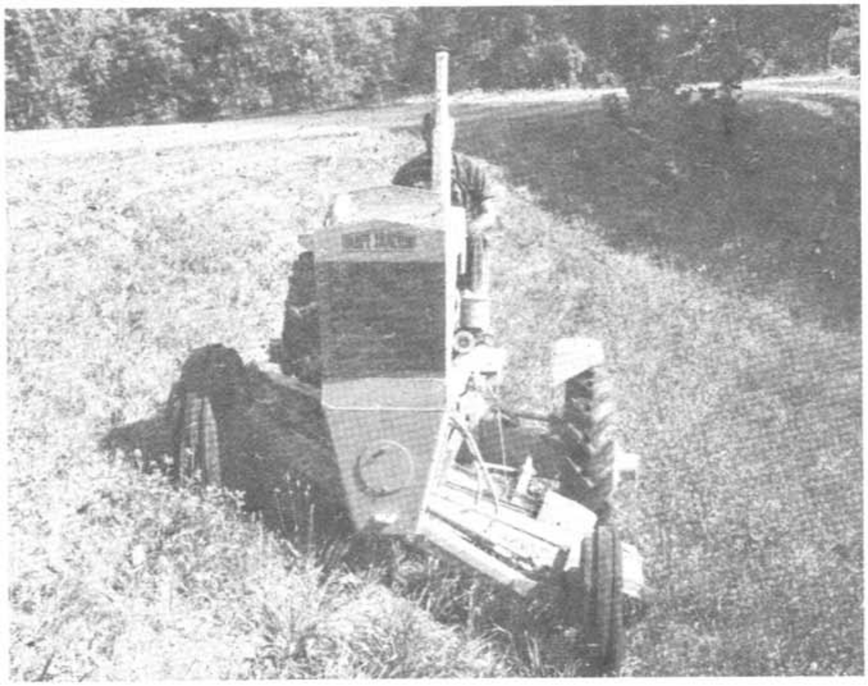


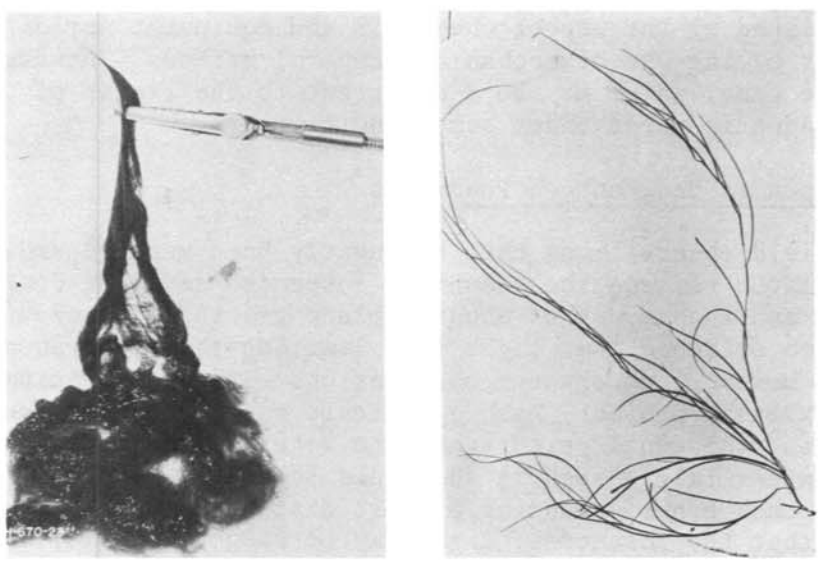
Figure 91

CONTROL OF AQUATIC WEEDS

The Problem

Uncontrolled growth of aquatic weeds in canals and laterals can materially affect their carrying capacities. This is especially true during the hot summer months when the demand for water is greatest and any interruption in service means costly crop losses.

Aquatic weeds are often classified into three types; submerged, emersed, and surface. Aquatic weeds consist of true moss, algae, pondweed, and similar types of growths that occur primarily within the water prism of waterways. Typical plants of this type are shown in figure 92.



Algae Sago Pondweed

Figure 92

True moss may grow in water, but is often found on shady banks at the waterline or above. Water channels in the United States are seldom infested to a degree necessary for control. In other countries moss is a problem, and control methods have been developed which are superior to mechanical scraping. Waters low in salts are most likely to contain moss. True moss has parts which strongly resemble stems and leaves.

Algae is often called moss, frog moss, or green slime. The filamentous kinds, as shown, offer the most problems in irrigation systems. Prevention and control may be obtained by the use of copper sulfate, xylene, acrolein, or other chemicals. Waters high in salts may require more chemicals than less salty water. Of the weedy algae in fresh water, only a few forms resemble land plants with stems and branches. Chara - a pondweed-like algae - may often be found in irrigation channels. The plant has a gritty texture.

Pondweed, also called moss, water weed, ditch grass, and horsetail moss, is a rooted flowering plant. Sago, Richardsons, American, and Horned pondweed are several species of pondweed that are flowering plants which are obligated to live in water and which reduce the capacities of irrigation channels. These weeds must be prevented, controlled, or removed if the capacities of channels are to be maintained.

The control of aquatic weeds on irrigation projects is most effectively accomplished by the use of chemicals and equipment for dispensing them or by the use of mechanical control methods. However, sediment in the canal water may be a deterrent to the growth of some types of aquatic weeds under some conditions.

Effects of Suspended Sediment on Pondweeds

In the past, field observations have frequently been made regarding a possible correlaton between the amount of suspended sediment contained in canal water and the amount of aquatic plant growth in canals. There is no conclusive evidence that light is a limiting factor in aquatic plant growth. However, underwater observations with scuba equipment on the Columbia Basin project, Wash., indicate that pondweed growth occurs throughout the canal prism where the water is clear. In those channels with water fairly high in suspended sediment, pondweed growth occurs only on each bank, extending a short distance under water. It was concluded that the absence of light may be responsible for the lack of pondweed growth. Reports reviewed have not given details of the various factors contributing to suppression of aquatic plant growth.

Chemical Methods for Control of Aquatic Weeds

Only those herbicides registered and labeled for use in or around canals or ditches should be used, and only trained and qualified personnel should apply pesticides.

Copper sulfate treatment. - Copper sulfate has been used to control algae in municipal waters of the United States since 1904 following extensive research and recommendation by the U.S. Department of Agriculture. During more recent times, it has also proven effective in the control of algae and submersed aquatic weeds growing in irrigation water delivery channels. It will control filamentous green algae, such as *Cladophora, Ulothrix, Stigeoclonium,* and *Oedegonium* which are found growing in many canals and laterals on Reclamation projects. It appears to be less effective for controlling blue green algae which are less commonly seen growing in canals and laterals on Reclamation projects. Copper sulfate will also control submersed aquatic weeds of the *potamogeton genera*, such as horned, leafy, sago, American, and curlyleaf pondweeds and elodea which sometimes grow in irrigation delivery channels.

The slug and continuous application methods for application of copper sulfate will be discussed in considerable detail below. The use of these methods depends upon the particular conditions present. Suggested precautions to follow when using copper sulfate will also be discussed in more detail later in the section.

The problem of algae growth in the Madera Canal is typical of conditions in many other canal systems. This canal is 36 miles long and has an initial capacity of 1,275 cubic feet per second. Only the first 7.7 miles are lined, and it is this lined section which is appreciably affected by algae growth. Troublesome algae are *Cladophora, Oedogonium,* and *Ulothrix.*

The velocity at the head of the Madera Canal may approach 6 feet per second, which is greater than that in the Friant-Kern Canal. To allow sufficient contact time to kill the attached algae, copper sulfate is dumpted in over a period of 15 minutes. As shown in figure 93, the copper sulfate is dumped directly from paper bags into the concrete-lined section at the head of the canal, where the water is most turbulent. This results in excellent control and is less troublesome than suspending burlap bags of the material in the canal. Use of the burlap bags would be desirable when introducing copper sulfate in earth sections where the crystals might otherwise sink to the bottom and dissolve very slowly, resulting in low copper concentration in the water.

This treatment usually restores the canal to full capacity within 24 hours.

Figure 93

A schedule of the optimum time between treatments has been worked out, based on curves expessing the relationship between the discharge through the needle valves, discharging into the canal, and a gaging station located about a mile downstream from the dam. These curves are kept on a daily basis. When the recorder at the gaging station shows a 4- to 6-percent increase in the apparent canal flow and the valve discharge has not been increased, a treatment is scheduled. Likewise, a daily climb of 2 percent at the recorder (no increase having been made at the valves) usually indicates an application of copper sulfate is needed.

Treatments have been required most frequently during the warmer summer months. Four or five applications have sufficed for the months of June, July, and August, with two or three others spread over the spring and fall months.

The "slug" method of introducing copper sulfate into a canal to control submerged aquatic vegetation has been used on the Madera and Friant-Kern Canals on the Central Valley project in California for many years. In such large canals as the 4,500-ft^3/s, 153-mile-long Friant-Kern Canal, it is not economically feasible to treat the entire volume of water in storage; however, when the water is moving it is possible to treat a small "section" or "slug" of the water moving down the canal with a sufficient concentration of chemical to kill or injure the submerged vegetation as it passes.

As the chemical moves downstream, the concentration is reduced by longitudinal mixing and dilution, while the "section" of treated water becomes longer. Thus, as the concentration decreases, the time the treated water is in contact with the plant increases.

This method of introducing copper sulfate into a canal is a most effective practice in canals of moderate to high velocity. Where soft water is involved, the slug will travel many miles before it finally becomes ineffective. Where hard water is a problem, the slug method is still considered to be more efficient than other methods, and less copper is required to satisfy the demands of the negative ions which precipitate copper in treating a short slug of water than when treating a large volume.

In introducing copper sulfate so that it will be effective for a maximum distance, it is desirable that a high initial concentration be obtained on dumping. Where control is desired for only a short distance, lower rates can be used.

This method has been used to eliminate algae and submerged aquatic vegetation in the large Friant-Kern Canal. This was accomplished by adding copper sulfate once every 2 weeks. The material was introduced as rapidly as possible at the head of the canal and at another station 85 miles downstream. Treatment was begun early in the season, when the weeds were very small, and continued throughout the growing season. Troublesome vegetation eliminated were the filamentous green algae *Oedogonium, Cladophora,* and *Ulothrix; Chara;* and water weeds including water buttercup (*Ranunculus spp.*), leafy pondweed (*Potamogeton, foliosus*), curly-leaf pondweed (*P. crispus*), and American pondweed (*P. nodosus*).

It has been found that water weeds originating from fleshy perenating organs are more difficult to eliminate than those not having such structures. Water buttercup, which develops from a seed, disappeared after only six treatments with a peak copper concentration in the water of 3 p/m (parts per million) and a contact time of 20 to 25 minutes. American pondweed, which develops from overwintering buds, resisted these treatments for most of the season and finally disappeared in September when organic debris from the surface waters of Lake Millerton was deposited on the submerged plants, causing them to collapse onto the substrata and decay. It has not reappeared since.

To obtain as high a concentration as possible, "fine" crystals are dumped in as rapidly as possible where the water is most turbulent. The material is introduced in concrete-lined sections where possible. At the head of the canal the bags are emptied into a dump truck; the load is then dumped rapidly into the canal, as shown in figure 94.

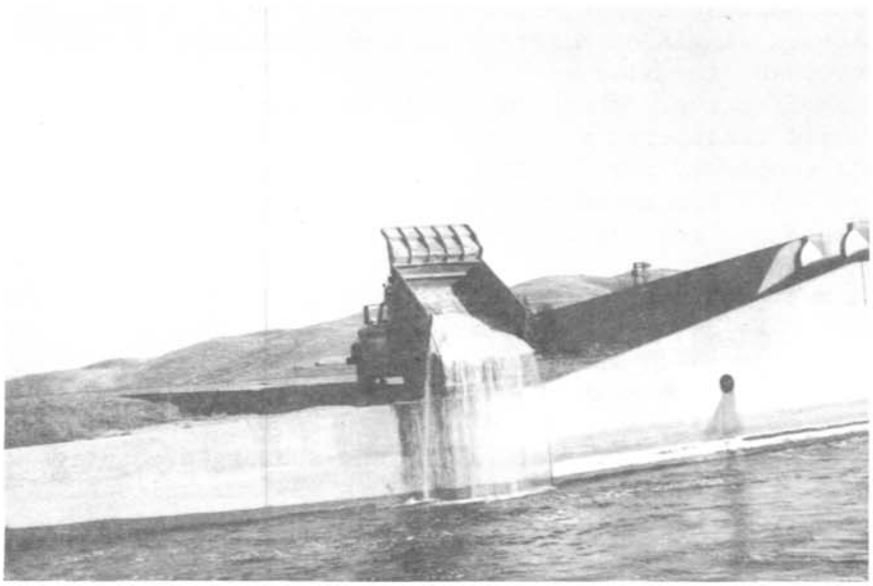


Figure 94

The possibility of dumping at lower rates at stations closer to one another has been considered. This is justified where treated low flows are flowing into a large volume of water stored above a check gate. In such situations, a rate sufficient to control the vegetation upstream from the check is introduced, and additional material is dumped at another station just below the check.

It may also be necessary to dump the copper sulfate at lower rates and at more frequent stations where it is desired to keep the copper concentration below a level toxic to fish. In such a situation, however, the continuous introduction of very low rates of copper sulfate, as developed by the Denver laboratories, should be investigated.

Some plants have resisted copper sulfate treatments, such as submerged cattail seedlings, spike rush, *Elatine, spp*, and swamp knotweed. These have not been controlled by the repeated copper sulfate treatments. Asiatic clams in the canals also are not affected. Snails, which carry swimmers itch, have been eliminated.

In 1970, samples of Friant-Kern Canal bottom soil were sent to the Denver laboratories to determine the copper concentration. Analysis revealed that copper sulfate treatments had increased the copper content of the canal bottom soil from 48 p/m in 1966 to 60 p/m at Mile 40.2 and from 27 p/m to 80 p/m at Mile 120. Tests have shown that this is not a sufficient concentration of copper in the soil to prevent reestablishment of water weeds should treatment of the water be discontinued.

Use of copper sulfate over a period of many years has not resulted in any damage to crop plants. Care must be taken when working with the copper sulfate crystals as they will burn the lungs and eyes. Copper sulfate dust should not be taken into the lungs or mouth, nor should the skin be exposed to the chemical at high concentrations for long periods of time. Once the material is in the water, there is little danger to persons or livestock who might drink the treated water, when used at the rates indicated above.

The results obtained using copper sulfate can be determined by observing the vegetation growing at points downstream.

Filamentous algae may break loose from the lining in many small fragments, but long streamers often turn brown and remain attached. The tips of small water weeds have a bleached appearance, and such damage is evident when adequate concentrations are used. Many treatments may be required before the weeds are finally eliminated. In warm water, weeds may tend to outgrow treatments made every 2 weeks, and more frequent treatments may become necessary.

In the application of large crystals of copper sulfate to an earth section of the East Low Canal, Columbia Basin project, Wash., the copper sulfate is suspended in *open mesh bags* (fig. 95) so that the crystals will dissolve in 20 to 40 minutes. A nylon net bag is convenient to use and has a long life. If dumped onto earth canal bottoms, those crystals which become embedded in silt may not dissolve for several hours or days.

The copper sulfate *bagging device* shown in figures 96 and 97 was constructed by personnel of the Columbia Basin project. With this device, copper sulfate may be placed in open mesh bags with very little dust and contact with the skin.

The *water-powered dispenser* shown in figure 98 was shop built from readily available parts by the Lewiston Orchards Irrigation District to apply copper sulfate on a continuous basis to the Sweetwater Canal for control of rooted, submerged aquatic weeds. The copper sulfate hopper, auger, gear box, and bicycle

Figure 95

Figure 96

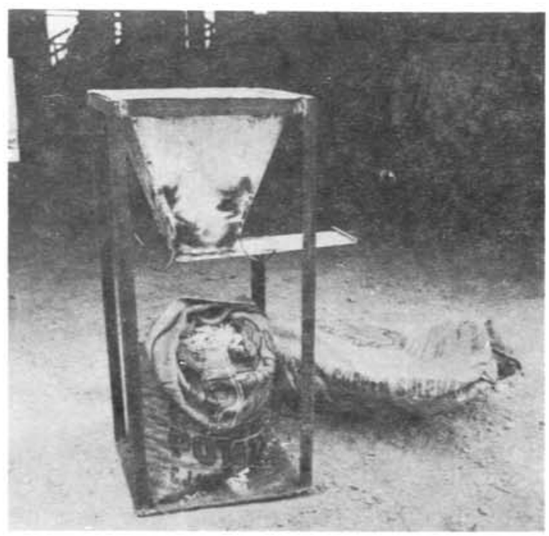


Figure 97

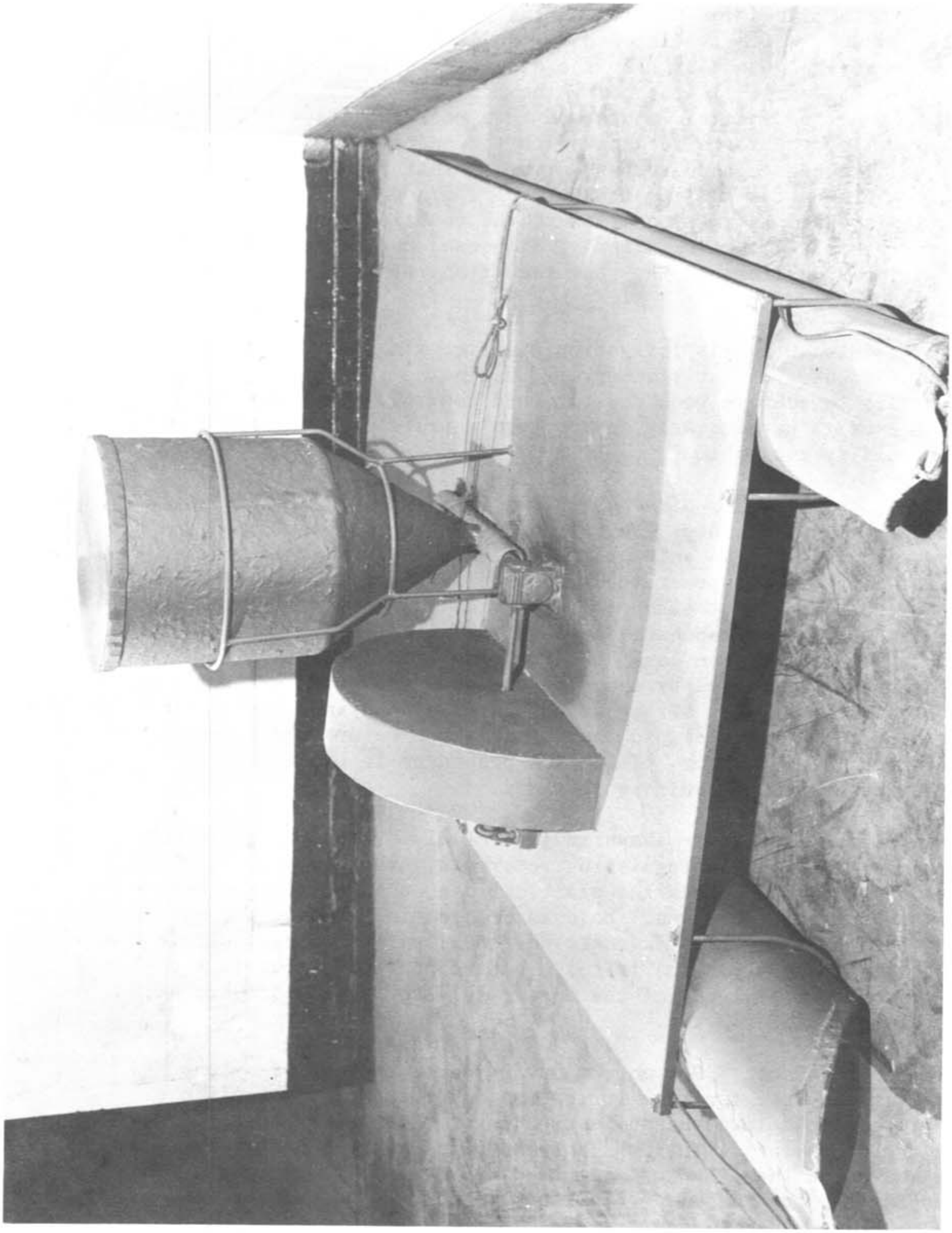


Figure 98

wheel with plates for paddles on the perimeter are mounted to a plywood deck which is fastened to two 10-inch-diameter pipes that act as pontoons to keep the dispenser afloat. The bicycle wheel with paddles is turned by the flowing water. The drive shaft from the wheel is connected to a gear reduction box. At this point, the force is applied to the auger. The rotating auger dispenses copper sulfate crystals that feed from the hopper into the pipe housing the auger. The amount of copper sulfate dispensed is in proportion to the rotating speed of the water wheel. Amount of material dispensed can be regulated by changing such items as the gear reduction ratio and the size of the auger.

The Lewiston Orchards Irrigation District manager reports that this dispenser is satisfactory in dispensing the copper sulfate crystals to achieve good aquatic weed control. This type of dispenser is particularly appropriate where electric power is not readily available.

The *electric-powered dispenser* shown in figures 99 and 100 is commercially available. This type dispenser is constructed in one compact unit, as shown in the figures. A small electric motor provides the power to drive a helical screw positioned long the bottom of the hopper that holds the copper sulfate crystals. These dispensers are equipped with timers for selecting the amount of "on" and "off" time desired. The rate of dispensing can be varied by changing the gear ratio and size of the helical screw. This dispenser should be placed in a house located over the canal, so the crystals can be dropped directly into the flowing water. This type dispenser is excellent for applying dry copper sulfate crystals.

The *floating dispenser* shown in figure 101 is used for algae control in the Arbuckle regulating reservoir, Arbuckle project, Okla. The floating raft buoys the plastic trash container filled with copper sulfate. One small hole is drilled in the side and one in the bottom of the plastic container to allow the copper sulfate to dissolve slowly. The raft is located near the inlet to the reservoir. Dissolving of the copper sulfate is accomplished at a relatively uniform rate.

<u>Xylene treatment</u>. - For more than 20 years, the use of xylene has made it possible for some irrigation districts in the Pacific Northwest to deliver adequate amounts of clean water to all farms on their projects. This was not the case when the districts relied on chaining and other methods to control these weeds. This program has been carried out without injury to man, livestock, or

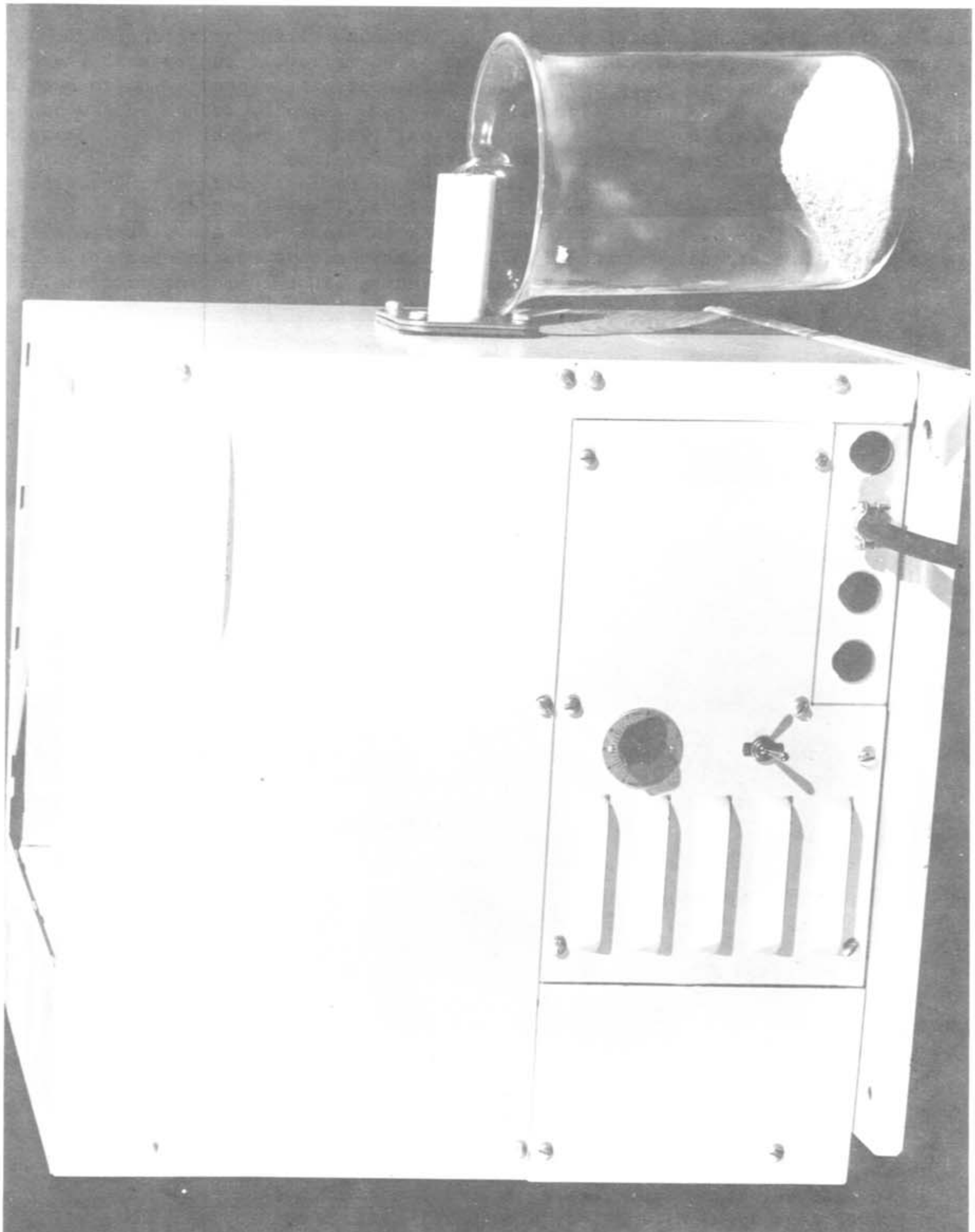


Figure 99

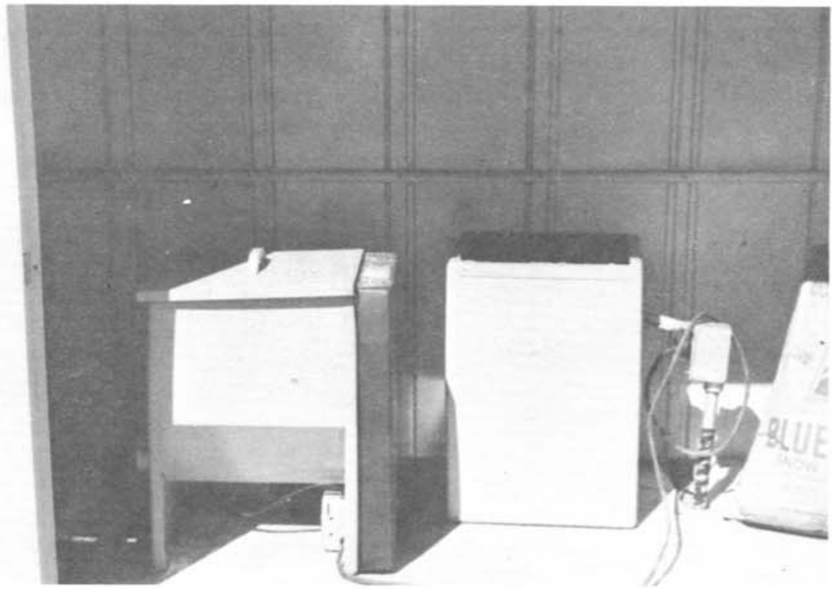


Figure 100

Figure 101

crops. While the greatest benefit from the use of xylene has been in the districts being able to give uninterrupted service of adequate quantities of clean water to all farms, the saving in cost to the water users has been substantial.

The xylene is applied to the water in these irrigation channels at 4 to 10 gallons per cubic foot per second over periods of 30 to 45 minutes. It is nonmiscible with water and, consequently, can be dispersed in the water only with the help of an emulsifier. Over 20 years' experience, together with extensive research, shows that the treated water can be used safely for irrigation of crops. It is estimated that 95 percent of the water containing xylene is used for the irrigation of crops. This includes irrigation by sprinklers, furrow, corrugation, and flooding.

Xylene will control pond scum (algae), coontail, chara, horned pondweed, elodea and sago pondweeds, and certain other water weeds growing in irrigation and drainage channels.

Xylene is generally applied only in smaller canals and laterals due to relatively high cost and physical limitations. It is applied at the relatively high dosage range of 4 to 10 gallons per cubic foot per second. Xylene supply tanks rarely if ever exceed 1,000 gallons in capacity. A 1,000-gallon-capacity supply tank could only handle a 250-cubic-foot-per-second flow at the 4-gallons-per-cubic-foot-per-second rate and a 100-cubic-foot-per-second flow at the 10-gallons-per-cubic-foot-per-second rate.

Xylene applied at these necessary rates will kill fish and other aquatic organisms and should not be used if a fish kill must be avoided. When using xylene, do not allow return flows of treated irrigation water into receiving rivers and streams if xylene residues are above 10 parts per million.

Because xylene affects only those portions of the pondweed aboveground, control is temporary. It is necessary to repeat the treatment when a new growth of weeds begins to fill the channels. Two or more applications are required during each growing season.

The use of xylene in the control of aquatic weeds has gained widespread acceptance, and a discussion of equipment for the handling, mixing, and storage of these materials follows.

Figure 102 shows a sketch of the components of the typical xylene application equipment in use on the Columbia Basin project, Wash. The supply tank generally has a capacity of 1,000 gallons, which

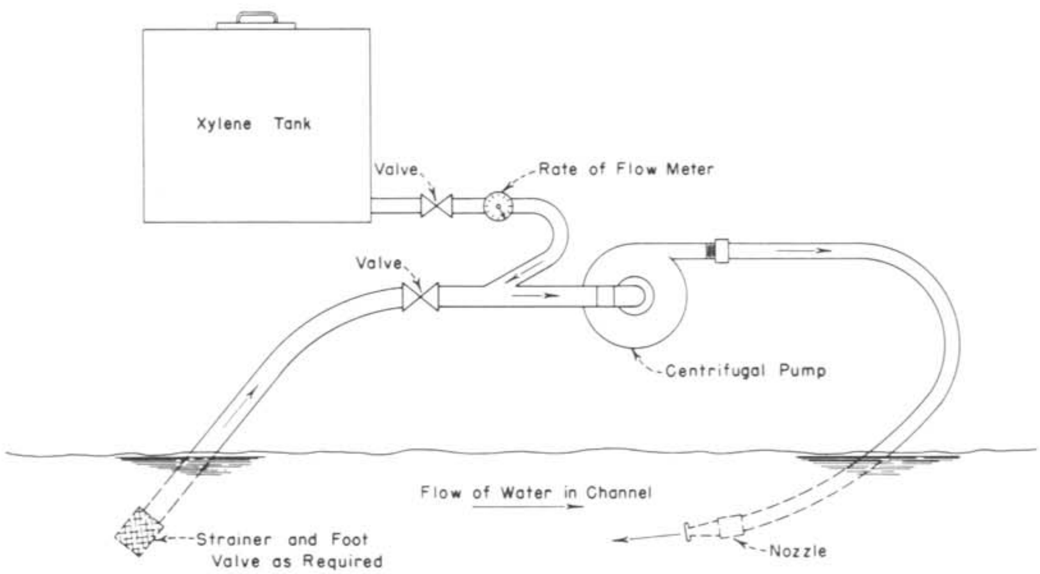


DIAGRAM FOR ASSEMBLY OF TRUCK MOUNTED APPARATUS
FOR APPLYING XYLENE IN IRRIGATION CHANNELS
FOR CONTROL OF AQUATIC WEEDS

Figure 102

Figure 102a

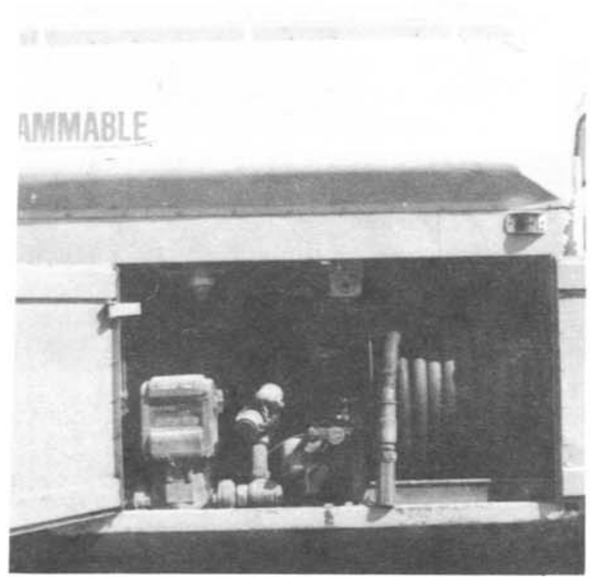


Figure 102b

is sufficient to treat a lateral containing 100 cubic feet per second at a typically high rate of 10 gallons xylene per cubic foot per second. A deflection-type flowmeter is installed in the xylene delivery line. The flow of xylene is regulated by a valve between the tank and meter until the meter reads the desired rate of flow.

This particular meter is calibrated for xylene at rates of 3 to 15 gallons per minute. The same meter will measure larger flows if placed in a bypass position with dial scales made to correspond to the calibration of the hookup.

The meter scale should be recalibrated for each type of liquid metered if there is a wide difference in velocity or a specific gravity difference of 0.15 or more. Rates of flow smaller than 3 gallons per minute can be measured by a smaller meter.

Deflection-type meters are inexpensive, may be mounted in any position, have only one moving part, and can be obtained in aluminum, bronze, or other noncorrosive materials.

Figures 102a and b show a xylene application truck used by the South Columbia Basin Irrigation District, Wash. The used gasoline tank truck has a capacity of 1,300 gallons of xylene. This rig is equipped with the standard totalizer type of petroleum meter found on most gasoline delivery trucks. The meter as shown in figure 102b, gives an exact account of the number of gallons of xylene applied during each application.

Probably the major component of this apparatus is the pump and power unit. A centrifugal pump is desirable because of the high volume of liquid moved at low pressures. By introducing the xylene ahead of the pump, it is thoroughly mixed with the water before it is injected into the canal. Other advantages of a centrifugal pump are its low initial cost and maintenance. The gasoline motor should have adequate horsepower to operate the pump at the desired capacity.

In applying xylene to control submersed water weeds, it is recommended the concentrated solvent be introduced at a drop structure so that the turbulence of the water will effect good mixing. Naturally, ideal conditions for mixing the chemical with the water do not exist at every point where introductions are to be made, so other means of mixing the chemical and water must be utilized. The most effective method found to date is the system shown in figure 102, where xylene and water are mixed in a centrifugal pump.

Acrolein treatment. - Acrolein has been used for about 15 years to control submersed squatic weeds in irrigation systems in the United States and other countries where open channels are used to distribute water for crop production. Over a period of years, methods and equipment used to apply acrolein have been refined and will be described on the following pages.

Acrolein is a liquid lacrimator and is tear gas in gaseous form. For this reason, it must be released beneath the water surface to avoid exposure to applicators or other persons nearby. All typical submersed aquatic weed and algae species appear to be susceptible to the effects of acrolein.

Acrolein is applied at a dosage range of from 1/6 gallon to 3 gallons per cubic foot per second. This relatively low dosage range makes it reasonably simple to transport and store the necessary amount to accomplish the purpose. For this reason, acrolein is suitable to use for treatment of relatively large canals and laterals. Of course, it may also be used in smaller canals and laterals.

Acrolein will kill fish and must not be used where a fish kill is not desired. It is wise to consult the local state Fish and Game agency before applying it. Application should not be made to water drainage areas where runoff or flooding will contaminate ponds, lakes, or streams.

Magna Corporation, the sole supplier of acrolein, publishes a description and use bulletin and a safety and application equipment bulletin for users. These bulletins should be thoroughly read and understood before making acrolein applications.

The acrolein formulation is received in steel cylinders or tanks, as shown in figure 103. Nitrogen gas is used to pressurize the container. Through the use of proper pressures, valves, and metering orifices, a uniform rate of acrolein can be injected into the irrigation water. The metering equipment used to apply acrolein to an irrigation canal is shown in figures 104 and 105.

The acrolein application equipment uses a cylinder of nitrogen to pressurize the acrolein tank, a double-stage regulator to maintain a constant tank pressure, a metering orifice, and polyethylene tubing to convey the acrolein to the bottom of the canal.

The Quincy-Columbia Basin Irrigation District has constructed a wooden skid for storage and transportation of acrolein and nitrogen tanks, figure 106. This structure has the advantage of keeping the two tanks together and provides stability to prevent the