AQUATIC WEED CONTROL

THE STRIP METHOD

By L. E. Bitting, Sr.
Old Plantation Water Control Dist., Plantation, Fla.

Bitting: "The strip method can be utilized in many problem situations."

NOXIOUS SUBMERSED WEEDS in the waterways of Old Plantation Water Control District must be controlled or its drainage facilities, developed at great cost for the express purpose of protecting homes and industry from flooding, will be useless.

In past years when Southern Naiad was our number one problem, and before weed control was begun, water stage differentials of three and one-half feet over a reach of one and three quarters miles at times continued for almost two weeks. In such a situation, modern and adequate drainage pumps were idled for lack of water, while nearby lands were flooded.

Now, Hydrilla, a harder to kill plant having phenomenal regenerative capabilities, poses an even greater threat. A typical marginal infestation of Hydrilla, if left unchecked, will cover a canal from bank to bank and from bottom to top. Small canals in remote areas may reasonably be given a full volume herbicide treatment and good control is obtainable with predictable results. However, large volume waterways in urban areas demand completely different management.

STRIP TREATMENT

Although marginal strip treatment is not a new concept in aquatic weed control, it may be helpful to note some of its advantages and disadvantages for those who contemplate its use for the first time.

This method is economical because only a portion of a given waterway is treated to control concentration, and if treatment is begun before weeds cover the entire submerged area, this may be enough to halt their spread. Damage to aquatic organisms is vastly reduced as compared with full volume treatment, and the normal ecological balance is soon restored.

Some faults of the strip method are: There is occasionally poor or no control due to dilution; adverse effects of the variables in weed control tend to be magnified, thus loss of time and material is more frequent; unharmed plant segments provide material for reinfestation; it is more difficult to plan efficient rates and application procedures because of irregularities in weed stand, depths, flows, cross-sections, etc.

APPLICATION

As an example, the infested margin of a canal was measured and found to average 20 feet in width and 8 feet in depth, thus an imaginary triangle with a cross-section of 80 square feet. Our aim was to treat this section with Acrolein at the rate of 7 p.p.m./v. Treatment was begun on June 25, 1968, with others following periodically and with rates running from 7 to 9 parts per million.

RESULTS

In seven days, plants were defoliated and limp. Twelve days after treatment, algae was gone and the surface clear of Hydrilla. Acceptable control continued for about six months in nearly all treated margins.

FISH KILL

Fish kill was far lighter than expected. An initial pick-up was made the day after treatment with follow-up as needed.

TECHNIQUE

Since Acrolein is very toxic to fish and this canal had a high fish population, a high fish loss was possible. However, as stated previously, loss was low and the method of application was believed to be an important factor. As the sprayboat advanced in shallow, edge waters, fish were constantly observed darting into deep center waters. Acrolein was injected 2-4 feet from the water's edge and allowed to spread through the Hydrilla stand. Evidently, very few fish returned to this chemical cloud, but rather stayed in fresh center waters thus escaping lethal contact.

A relatively long treatment section does not seem to be detrimental as long as only one margin is treated

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at a time. An interval of at least a week should be allowed between treatments.

EQUIPMENT

The application pipe was a ten foot length of ½ inch thin wall electrical conduit with three inches of the outer end curved down to aid injection and shed trash.

Chemical was educted into the spray system as opposed to a pressure activated system; metering was accomplished by an orifice plate in the eductor line. Various apertures may be used to accommodate the desired output and boat speed. Gasoline may be used to calibrate the equipment.

MISCELLANEOUS OBSERVATIONS

Herbicidal activity of Acrolein was much slower than was normally observed in full volume treatment even though summer temperatures prevailed.

In several instances, small feeder canals were treated on one margin only. Filamentous algae were removed and the margin remained clear for two to three months while the opposite edge supported the usual heavy growth.

The fact that Acrolein requires a relatively short contact time, and degrades rapidly, makes it useful for marginal strip use.

We hope that research will soon bring a compound into practical use that will be non-toxic to fish as well as an effective control agent, but until then, Acrolein and the strip method can be utilized in many problem situations.

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and formulations. Ease of applying 2,4-D granules was improved by Amchem's Spreader Disc for helicopters and the West Point Products Aeriblower for shoreline boat application. Last year, based on previous test plot work, the dimethyl amine form of 2,4-D was applied large scale during the month of May with considerable success. Steenis (1) has been utilizing fluctuating tidal movement to minimize operational difficulties. In its efforts to control milfoil in 1969 the Engineers utilized both helicopter and boat blower systems for applying granular 2,4-D. In Florida a multiple-agency operation organized a large-scale test program and used everything from an airboat to a helicopter to apply a wide range of herbicides and formulations to control Eurasian milfoil which had become a potential hazard to its resort spring attractions. A number of materials were effective, but all are more expensive than 2,4-D. Although 2,4-D is a partial chemical answer to this particular species, milfoil spreads so fast that no single approach is adequate. The 15 papers presented at a one-day TVA conference on watermilfoil research and control gives an idea of the scope of research activity by personnel involved with the species.

Elser (2), responsible for directing the operational weed control work in Maryland, reports that the decline of tremendous acres of Eurasian watermilfoil in the Chesapeake Bay could be pathological. Two diseases, Lake Venice and Northeast (names for convenience as they have not yet been positively identified and classified) were generally found in the regions of large-scale milfoil decline. Elser reports that Suzanne Bayley of Johns Hopkins University determined that the Northeast disease organism is a filterable agent, possibly a virus. A small controversy exists in the minds of several researchers as to whether the "disease" is in reality a response to high salinity associated with salt water intrusion which occurred over a period of drought years.

The amount of work on other submersed species is generally related to problem size and rate of increase. Florida elodea is rapidly becoming a major weed problem in Florida waters. Blackburn (3) found that acrolein, aromatic solvents, copper sulfate and a diquat-copper sulfate mixture provided temporary control, but the diquat-copper sulfate is the only treatment not highly toxic to fish. Other work on elodea reported over the past few years shows copper sulfate mixtures of copper sulfate and diquat, diquat plus endothall, and blackstrap molasses added to phenoxy compounds controlled this species. Ware (4) reported that 100 lb. of copper sulfate per surface acre provided economical control of elodea. Larger crystals produced better control. Foret (5) used blackstrap molasses as a source of aconitic and itaconic acid and glucose. These materials added to phenoxy compounds increased control of elodea and other submersed species. In the laboratory at Ft. Lauderdale where the nutritional and reproductive studies of Florida elodea simulate field conditions, Weldon (6) found that the WASM formulation of endothall doubled or quadrupled effectiveness in field trials.

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