

The Safe Use Of Herbicides To Control Aquatic Weeds In Lakes And Ponds

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First of all, safe use of pesticides implies acceptance of a safety attitude. Safety should be an instinctive routine action rather than an erratic occasional one to meet special requirements. Connotations of safety in terms of aquatic use are quite complex since most bodies of water are mobile and are complicated by multiple uses. Certainly the safety of those directly involved, such as the applicator and contracting party, must be considered. More important, though, is the safety of the many associated interests which make up the innocent bystander complex.

Since most bodies of water have the potential of moving out from under a treatment, the weed problem control action-factor is simply the justification for calling in an applicator. Once you as the applicator are involved, safety considerations suggest that you should think of the long-range objectives—modifying a problem plant situation with a minimum of interference with the overall environment. However, when committed you would be well advised to operate under the premise that if you have not anticipated a problem you have not adequately planned the job.

The very nature of lakes and ponds means that people are part of the situation. The applicator and the hiring group, because of direct involvement, automatically accept a risk. It is the person who does not get the word who has to be protected. Such persons are exemplified by the downstream water user, the too-busy housewife who does not have time to read the papers, or the illiterate who cannot read the posters. These people must be contacted and warned of potential dangers.

At a recent meeting of the Hyacinth Control Society Edgar G. Hamilton, a lawyer, was discussing liability and stated, "If your herbicide damages your neighbor's crops, you should and probably will be held liable for such damage. Therefore, the possibility of causing damage to your neighbor's crops and the effects of such damage on him and you should be considered in determining whether or not to spray these herbicides (1).

Whether or not a weed problem exists is quite often determined by a "whose ox is being gored" philosophy. When the weed mass becomes severe enough to affect a high percentage of the local population or it reaches an economic nuisance stage requiring immediate remedial action, we can say that the stage of an explosive problem in terms of population irritation has been reached. This is when pleas to get rid of the weeds at any cost are heard. Since your financial safety is involved, a thorough check of the whole situation is warranted. Do not let yourself be precipitated into unwise action.

CHEMICAL SAFETY

In an article on herbicide use for weed control in world waterways, Dr. Holm said, "One of the quickest and most efficient ways to kill such weeds is with herbicides. The herbicide 2,4-D and its relatives are used in many places

in the world. It should be emphasized that these chemicals are known to be harmless to fish and wildlife when used properly." The key phrase here is "when used properly." Follow the rules of safety which require you to handle any and all pesticides with care. They are designed to kill aquatic pests; be sure they do not kill you.

As a general rule, the herbicides used for aquatic weed control are of a low order of toxicity to humans and warm-blooded animals. There are, however, a few exceptions. Safe use requires that you handle any pesticide with care. Proper handling implies three areas of responsibility. The federal and state governments must provide the required legislation. The manufacturer must package and label clearly and accurately, listing all hazards and emphasizing dangers. The applicator is responsible for safe use and should never forget it.

APPLICATOR SAFETY

When handling chemicals, the applicator should be aware of the following danger areas:

Inhalation. Do not inhale vapors, dusts, or mists. Wear respirators when so recommended by the label. (With some chemicals, this can be a pretty drastic way of stopping smoking!)

Dermal irritation. Do not allow chemicals to come in contact with your skin. In case of accident, wash skin immediately.

Eyes. Only one pair per individual. Wear goggles whenever drift of dust or spray mist is possible. Always have clear water available to rinse if either the concentrate or diluted material reaches the eyes.

Protective clothing. Clothing and equipment should not be used continuously without periodic cleaning; the more toxic the chemical, the more frequent the washing should be. Have an aerated storage place with an easily reached section for protective clothing and equipment. Chemicals, also, should be stored in isolated, well aerated, well lighted sheds. All containers should be kept sealed and well labeled. The unlabeled herbicide is as much of a potential hazard as the supposedly unloaded gun.

FISH AND WILDLIFE SAFETY

When fish and wildlife interests are to be considered, the problem of using aquatic herbicides safely is a little complicated. Fish and wildlife specialists both want weed plant manipulation, but sometimes one man's weed is another man's food crop. We must somehow provide for their needs and still meet the requirements of the people paying the bill. This conflict of interests needs tactful handling.

In most states a permit is required before an aquatic herbicide can be applied. Generally the Conservation or Fish and Wildlife service must approve these permits. This

gives an opportunity to protect their interests. You, as an applicator, may have to suggest alternative ways of treating. Some of the following may be offered:

1. Block treatment. In confined areas of little water exchange, limit the area being treated to avoid an oxygen deficiency. Never plant to treat more than 50% of the total area at one time.

2. Selective treatment. Since many chemicals are not broad-spectrum, if possible choose the one to handle the major weed problem, leaving the lesser problem weeds to provide protection for small fish, and as the weed fringe which fishermen seem to feel is absolutely essential for good fishing.

3. Time of application. This is simply the practice of timing treatment to interfere least with fish or wildlife requirements. Make ice applications, offseason applications, or applications in conjunction with drawdown treatments.

There is a statement which quite frequently appears in pesticide safety recommendations: "When given a choice, pick the one of least toxicity." For those of us in aquatic weed work, common sense dictates that we follow this rule, but we rarely have that complete freedom of choice. First, we do not have available a wide variety of materials from which to choose. Secondly, the efficiency ratios of different compounds vary considerably. In the third place, we are too closely limited by a philosophy of "kill the weeds but don't . . ." and the don'ts are too unlimited. We have to compromise and usually do.

Given a choice, I am sure that we would take the one that provides the best balance between performance and safety. To do this requires knowledge of herbicides. Some of the factors to consider when choosing a herbicide (assuming that we have a choice) are:

1. Application. Do you need special equipment to provide safe uniform distribution?

2. Mode of action. Is the chemical a slow-acting systemic, or a fast-acting contact herbicide performing as a chemical mower? Realize that rate of knockdown and disintegration can be a hazard to fish.

3. Formulation. Does the formulation lend itself readily to application under a wide range of conditions? Do you have to consider drift and volatility as ever-present hazards? Thickened formulations or granulars can offer increased protection against drift.

4. Rate of disappearance. Residual herbicides which do not break down readily or have not been absorbed by plants can cause problems as they move with treated waters and are used for other purposes such as stock watering, irrigation, or even potable water supplies.

5. Timing. There are situations where we can pick our time of application. This greatly increases the safety factor. We have herbicides that can be used on ice; five acres is the limit for this method. We can use the drawdown technique; no size limit, but water seepage and bottom springs can cause spotty results. Finally, we can treat off-season when danger to the majority of users is at a minimum.

One final caution: wind, with its resultant drift of herbicides, is often the critical factor in herbicide misapplication. In aquatic work, we have a second area of mobility—the water itself.

The following three steps, if taken, will go a long way towards the safe application of herbicides: First, post the area and use all the advance publicity you can obtain to alert the populace of your action. Second, map the area; know from where the water comes, where it goes, and how it is used. Note particularly the direction of prevailing winds. Third, have ready access to constant wind information even to the extent of carrying your own equipment.

This is not a complete safety program; it is only meant to stimulate a safety attitude. In conclusion, let me rephrase my earlier premise: "If after you start your operation a problem develops, you surely did not plan ahead adequately."

LITERATURE CITED

1. Hamilton, Edgar G. 1966. The Effect of Herbicide Damage on Private Farming Interests. *Hyacinth Control Jour.* 5:21-26.