

CHEMICAL FACT SHEET:

DIQUAT**Manufacturers and Formulators**

Valent U.S.A. Corporation is the sole distributor of the active ingredient diquat dibromide (6,7 dihydrodipyrido (1,2-a:2',1'-c) pyrazinediium dibromide, commonly referred to simply as "diquat") in the United States. Valent

sells a formulated diquat product. Other companies purchase concentrated diquat from Valent to formulate their own products. The following diquat products are currently registered with the Department of Agriculture, Trade, and Consumer Protection (DATCP) for aquatic use in Wisconsin:

Product Name	% Active Ingredient	Formulation	Application Rate
Valent Diquat H/A	35.3%	liquid	1-2 gallons/surface acre
Ortho Diquat H/A*	35.3%	liquid	1-2 gallons/surface acre
Aquaquat	8.5%	liquid	5-10 gallons/surface acre
Weedtrine-D	8.5%	liquid	5-10 gallons/surface acre

*Available through Dec. 1990.

Herbicide Effectiveness and Selectivity

Diquat is a non-selective herbicide which will kill or injure a wide variety of plants on contact. It is absorbed by plant foliage and works by direct damage to cell tissues. Diquat does not kill parts of the plant that it does not directly contact. Application of diquat at labelled rates results in plant decline or death in less than 7 days.

On most sites in Wisconsin, diquat may currently be used to control only three plant species: duckweed (*Lemna* spp.), watermilfoil (*Myriophyllum* spp.), and elodea (*Elodea* spp.). Diquat may be used to control other species listed on the product label only in aquatic sites where there is little or no outflow of water and which are totally under the control of the product's user. Any other use of diquat is a violation of federal and state law.

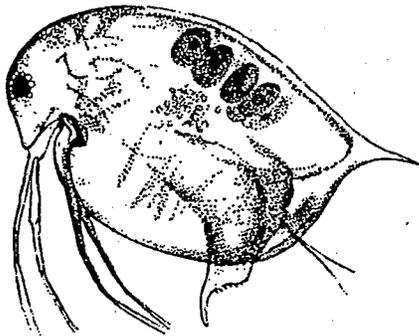
Use Considerations

Any person using aquatic herbicides for control of aquatic plants in Wisconsin waters must obtain a permit from the Department of Natural Resources (DNR). In addition, all liquid applications, or any herbicide treatment of more than 1/4 acre must be performed by a certified chemical applicator. Diquat is available only in liquid form.

Because of its high concentration of active ingredient, Valent Diquat H/A (previously sold as Ortho Diquat H/A) may only be applied by an applicator certified by the DATCP.

Individuals applying diquat products need to have protective clothing (faceshield and rubber gloves, aprons and footwear). Liquid herbicides should be applied with calibrated and properly functioning spray equipment. Other important safety precautions appear on the product label and must be followed.

Diquat will not be effective in lakes or ponds with muddy water or where plants are covered with silt because it is strongly attracted to silt and clay particles in the water. Therefore, bottom sediments must not be disturbed during treatment, as they may be from outboard motors. If applied to ponds or enclosed bays, only partial treatment (1/2 to 1/3 of the water surface) should be conducted. If the entire pond is treated, the decomposing vegetation may result in very low oxygen levels in the water. This can be harmful or lethal to fish and other aquatic organisms. Untreated areas can be treated 10-14 days after the first treatment.



Water Use Restrictions

The following waiting periods must be observed in using water treated with diquat:

Activity	Waiting Period
Swimming	24 hours
Animal Consumption, Domestic Purposes, Drinking, Irrigation	14 days

Alternatively, treated areas can be used if approved analytical tests indicate diquat concentrations are 0.01 parts per million or less in the treated water. These water use restrictions are set to minimize public exposure to diquat.

Registration Status

Federal law requires pesticides to be registered with the Environmental Protection Agency (EPA) before they can be sold or used. Due to significant changes in the federal pesticide laws, the EPA is reassessing the potential hazards arising from the currently registered uses of the pesticide.

This re-registration process will determine if additional data on health and environmental effects is needed, and whether the pesticide meets the "no unreasonable adverse effects" criterion of Federal law. "Unreasonable" means the risk of using a pesticide exceeds the benefits. EPA registers pesticides based on information submitted by product manufacturers, not on EPA's own tests.

The distinction between "EPA registered" and the terms "approved" or "safe" is important. Registration by the EPA means only that the benefits have been determined to outweigh the risks. Product use is not without risk.

Diquat is currently undergoing the re-registration process. Environmental fate studies and additional, more modern toxicity testing to meet current data requirements have been submitted and are being assessed by the EPA.



Diquat is sold and used in Wisconsin under a state special local need registration. This registration allows diquat to be used on sites not allowed by the federal registration, but imposes additional restrictions on the manner in which diquat can be used in order to prevent unreasonable adverse effects from occurring on these additional sites.

Impacts on Fish and Other Aquatic Organisms

At the approved application rate, diquat does not have any apparent short-term effects on most of the aquatic organisms that have been tested. However, certain species of important aquatic food chain organisms such as amphipods and *Daphnia* (water fleas) are adversely affected at label application rates. Direct toxicity as well as loss of habitat are believed to be the causes. These organisms only recolonize the treated area as vegetation becomes re-established.

Laboratory tests indicate walleye are the fish most sensitive to diquat, displaying toxic symptoms when confined in water treated with diquat at label application rates. Other game and panfish (e.g. northern pike, bass, and bluegills) are apparently not affected at these application rates. Limited field studies to date have not identified significant short or long-term impacts on fish and other aquatic organisms in lakes or ponds treated with diquat.

No studies have been completed on flesh tainting of fish from diquat treatments.

Because certain plant and animal species listed on the federal and state endangered resources lists and their habitats may be affected by aquatic treatments using diquat, a permit to use diquat may be denied or conditioned if these resources are present in the proposed treatment area.

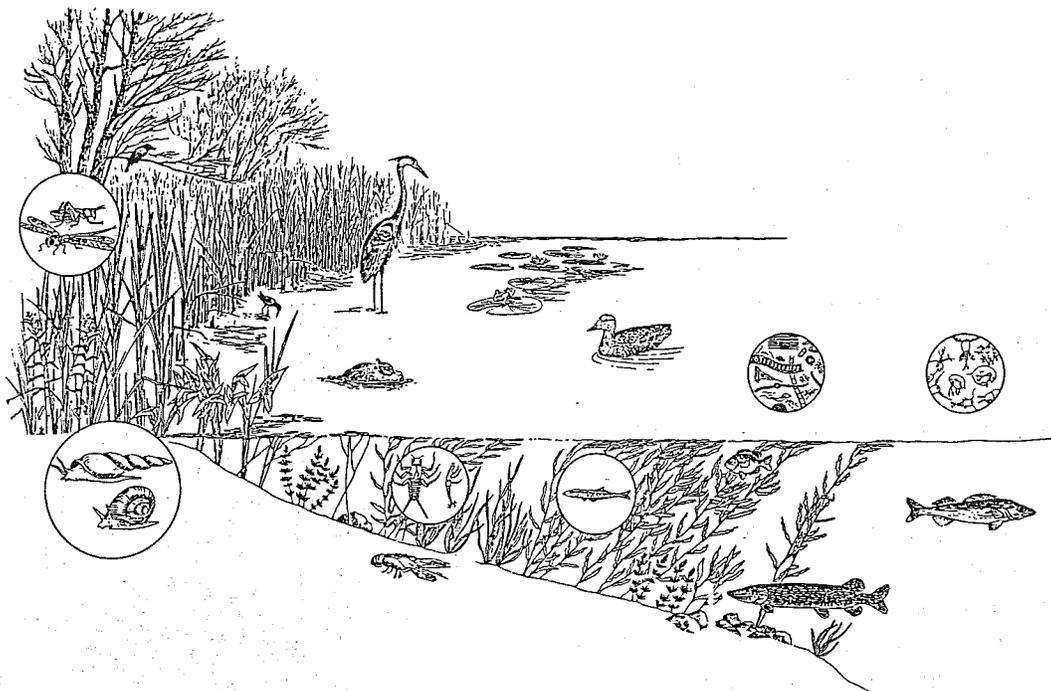


Herbicide Degradation, Persistence and Trace Contaminants

Diquat in treated water is reduced by 90 percent or more within 13 days after application. This reduction in concentration occurs through binding of diquat to the plants and the lake sediments. The adsorption of diquat to the sediments is rapid and irreversible. Diquat is not significantly degraded by microorganisms.

Ethylene dibromide (EDB), an animal carcinogen, is a trace contaminant in diquat products. At label application rates, EDB would be present in water at the treatment site at a concentration of about 10 to 30 parts per trillion. Drift and dilution will reduce this concentration in adjacent waters. EPA, using conservative exposure considerations, believes no significant impacts will occur to water users. The impacts of EDB on aquatic organisms at labeled rates is not known.





Human Health

Concerns about human health effects of diquat use primarily revolve around applicator exposure. Diquat causes severe skin and eye irritation and is toxic or fatal if absorbed through the skin, inhaled or swallowed. Wearing skin and eye protection (e.g. rubber gloves, apron and goggles) to minimize eye and skin irritation is required when applying diquat.

The risk to water users of serious health impacts (e.g., birth defects and cancer) is not believed to be significant according to the EPA. The chemical registration process, however, is not complete and the results of the required studies will not be available for several years. Based upon existing animal studies, some risk of allergic reactions or skin irritation is present for sensitive individuals.

NOTE: This fact sheet is published in accordance with chapter NR 107, Wis. Adm. Code. No endorsement of any chemical pesticide or plant control method is stated or implied. The DNR accepts no liability for damage or injury that may result from use of chemical pesticides under NR 107.

Applicants for permits under NR 107 are required to provide copies of applicable chemical fact sheets to any affected property owners' association and inland lake district. Copies of chemical fact sheets are also available upon request from the DNR.

For Additional Information

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