

**RESTRICTED USE PESTICIDE  
DUE TO A HIGH ACUTE TOXICITY**

For retail sale to and use by Certified Applicators and only to those users covered by the Certified Applicator's certification.

This product must be accompanied by an epa-approved product label and the epa-approved *AcroCide™ H Herbicide Application and Safety Manual*. The *AcroCide™ H Herbicide Application and Safety Manual* is labeling. Read and understand the entire labeling and manual prior to use. All parts of the labeling and manual are equally important for safe and effective use of this product.

# AcroCide™ H Herbicide

(Acrolein, Stabilized)

CONTENTS UNDER PRESSURE

**ACTIVE INGREDIENT:**

Acrolein ..... 96.0%

INERT INGREDIENTS: ..... 4.0%

TOTAL ..... 100.00%

This product contains the toxic inert ingredient hydroquinone.  
(*AcroCide™ H Herbicide* contains 6.7 pounds of active ingredients per gallon)

EPA Registration Number: 71173-2

EPA Establishment Number: 71173-TX-13

NET WEIGHTS: Cylinder-370 lbs. Skid Tank-2490 lbs. Skid Tanks-2737 lbs.



**KEEP OUT OF REACH OF CHILDREN  
DANGER/PELIGRO**

See right panel for additional precautionary statements and first aid statements

FIRST AID	
IF INHALED	<ul style="list-style-type: none"> <li>Move person to fresh air</li> <li>If person is not breathing, call 911 or an ambulance, then give artificial respiration, preferably mouth-to-mouth, if possible.</li> </ul>
IF ON SKIN	<ul style="list-style-type: none"> <li>Take off contaminated clothing</li> <li>Rinse skin immediately with plenty of water for 15-20 minutes.</li> </ul>
IF IN EYES	<ul style="list-style-type: none"> <li>Hold eye open and rinse slowly and gently with water for 15-20 minutes.</li> <li>Remove contact lenses, if present, after the first 5 minutes, then continue rinsing eye.</li> </ul>
IF SWALLOWED	<ul style="list-style-type: none"> <li>Call a poison control center or doctor immediately for treatment advice.</li> <li>Have person sip a glass of water if able to swallow.</li> <li>Do not induce vomiting unless told to do so by the poison control center or doctor.</li> <li>Do not give anything by mouth to an unconscious person.</li> </ul>
Call poison control center or doctor immediately for treatment advice. Have the product container or label with you when calling a poison control center, doctor, or going for treatment.	

**NOTE TO PHYSICIAN**

Probable mucosal damage may contraindicate the use of gastric lavage. Measures against circulatory shock, respiratory depression and convulsion may be needed.

**WARNING SIGNS AND SYMPTOMS:** Liquid *AcroCide™H Herbicide* is absorbed by the skin and is particularly irritating to any lesion and to the eyes. The vapors act principally on the mucous membrane of the eyes and respiratory tract. Because of the extreme lachrymatory warning effect, the concentration tolerable by man is for below the minimum lethal concentration.

**TREATMENT:** Treat exposed areas as a chemical burn. Thoroughly flush eyes with water and treat symptomatically. Persons exposed to *AcroCide™H Herbicide* vapors may have a delayed reaction and experience irritation of the respiratory tract. In severe cases, this may progress to pulmonary edema. Therefore, it is advisable to keep persons exposed to *AcroCide™H Herbicide* under observation for 24 hours following exposure.

**DOT Information: UN1092, Acrolein, Stablized, 6.1(3), PGII, Marine Pollutant, RQ, Toxic-inhalation Hazard Zone A Flashpoint -13F/-25C**

**PRECAUTIONARY STATEMENTS**

**HAZARDS TO HUMANS AND DOMESTIC ANIMALS**

**DANGER** Extremely flammable and irritating vapor and liquid. Fatal if inhaled, absorbed through the skin, or swallowed. Do not breathe vapors or spray mist. Corrosive. Causes irreversible eye damage. Do not get in eyes, on skin, or on clothing. Keep away from fire, sparks, and heated surfaces.

**PESTICIDE PROTECTION EQUIPMENT (PPE) REQUIREMENTS**

All certified applicators participating in the application during setting up and breaking down of application equipment and during visual inspection must wear:

- Coveralls over long-sleeved shirt and long pants,
- Shoes and socks,
- Chemical-resistant gloves made of butyl rubber, and
- A NIOSH-approved full face respirator with either
  - Organic-vapor removing cartridges with a pre-filter approved for pesticides (MSHA/NIOSH approval number prefix TC-23C), or
  - A canister approved for pesticides MSHA/NIOSH approval number prefix TC-14G).

Respirator fit testing, training and medical qualification:

Employers must ensure that all *AcroCide™ H Herbicide* handlers are:

- Fit-tested and fit-checked using a program that confirms to OSHA's requirements (see 29CFR part 1910.134)
- Trained using a program that confirms to OSHA's requirements (see 29CFR part 1910.134).
- Examined by a qualified medical practitioner to ensure physical ability to wear the style of respirator to be worn. A qualified medical practitioner is a physician or other licensed health care professional who will evaluate the ability of a worker to wear a respirator. The initial evaluation consists of a questionnaire that asks about medical conditions (such as heart condition) that would be problematic for respirator use. If concerns are identified, then additional evaluations, such as a physical exam, might be necessary. The initial evaluation must be done before respirator use begins. Handlers must be reexamined by a qualified medical practitioner if their health status or respirator style or use-conditions change.

**USER SAFETY REQUIREMENTS**

If *AcroCide™ H Herbicide* is spilled or leaked on clothing, gloves, or shoes, immediately remove them and wash thoroughly with soap and water.

Follow manufacturer's instructions for cleaning/maintaining PPE. If no such instructions for washables exist, use detergent and hot water. Keep and wash PPE separately from other laundry.

Discard clothing, gloves, shoes, and other absorbent materials that have come into contact with *AcroCide™ H Herbicide*. Do not reuse them.

**USER SAFETY RECOMMENDATIONS**

Users should wash hands thoroughly with soap and water after handling and before eating, drinking, chewing gum, using tobacco, or using the toilet.

Users should remove PPE immediately after handling this product. Wash the outside of the gloves before removing. As soon as possible, wash thoroughly and change into clean clothing.

**ENGINEERING CONTROLS**

Handlers must use a closed system that is designed by the manufacturer to prevent dermal and inhalation exposures by removing the product from the container and applying the product below the water's surface. At any disconnect point, the system must be equipped with a dry disconnect or dry couple shut-off device that will limit drippage to no more than 2 ml per disconnect. The closed system must function properly and be used and maintained in accordance with the manufacturer's written operating instructions. Handlers must wear the personal protective equipment required on this labeling.

**ENVIRONMENTAL HAZARDS**

This pesticide is extremely toxic to fish and wildlife. Do not discharge effluent containing this product into lakes, streams, ponds, estuaries, oceans or other waters unless in accordance with the requirements of a National Pollutant Discharge Elimination System (NPDES) permit and the permitting authority has been notified in writing prior to discharge. Do not discharge this product to sewer systems without previously notifying the local sewage treatment authority. For guidance contact your State Water Board or Regional Office of the EPA. Do not contaminate water when disposing equipment washwaters.

**PHYSICAL AND CHEMICAL HAZARDS**

**DANGER:** Extremely flammable. Contents under pressure. Keep away from fire, sparks and heated surfaces. Do not puncture or incinerate container. Acrolein, the active ingredient in *AcroCide™ H Herbicide*, is highly reactive chemically and readily forms polymers. If alkalies (such as ammonia and caustic) or strong acids are brought in contact with *AcroCide™H Herbicide* in a closed system, the biocide can polymerize with sufficient violence to rupture the container. Do not apply the equipment used for acids and alkalies. Contamination of *AcroCide™H Herbicide* with any foreign matter must be avoided.

A supply of sodium carbonate (soda ash) and water should be readily available for deactivating spilled *AcroCide™H.Herbicide* All spills should be confined and deactivated before disposal. See the *AcroCide™H Herbicide* Application and Safety Manual for additional information.

**DIRECTIONS FOR USE**

It is a violation of Federal law to use this product in a manner inconsistent with its labeling.

Refer to *AcroCide™H Herbicide* manual for directions for use.

*AcroCide™H Herbicide* is a water soluble material for the control of submersed and floating weeds and algae in irrigation canals. This material must be applied in accordance with directions in the *AcroCide™H Herbicide* Application and Safety Manual by a certified applicator or under a certified applicator's supervision. Do not permit dairy animals to drink treated water. Do not use where waters will flow into potential sources of drinking water. Water treated with *AcroCide™H Herbicide* must be used for irrigation of fields, either crop bearing, fallow or pasture, where the treated water remains on the field OR held for 6 days before being released into fish bearing waters of where it will drain into them.

One certified applicator must be present at the application site during the application. The applicator is to contact a member of their organization no less than every two hours during the course of an application. No handlers are allowed to participate in the application unless they are state certified (licensed) applicators and have completed the registrants training program within the last 12 months.

Maximum number of applications: 8 applications per year.

Minimum retreatment interval: 2 weeks

*AcroCide™H Herbicide* use will be restricted to eight (8) applications per application point per calendar year.

An individual application point as defined, may consist of multiple treatments/releases within a contiguous irrigation canal, to ensure aquatic weed control throughout the entire irrigation canal or portion thereof.

**POSTING OF APPLICATION EQUIPMENT AREA**

The Certified Applicator in charge of the application must post signs around the perimeter of the application equipment area (truck, hoses and skids). Signs must be no more than 15 feet apart and contain the following information:

- Skull and crossbones symbol
- DANGER/PELIGRO
- DO NOT ENTER/NO ENTRE: Pesticide Application/Aplicacion de Pesticides
- The name of the product being applied
- The start date and time of application
- The end date and time of application
- The name, address and telephone number of the Certified Applicator in charge of the application

Signs must remain legible during the entire posting period and must be removed once the application is completed and no later than 3 days after treatment.

Applications with *AcroCide™H Herbicide* may only be made in canals with posted no swimming signs. Contact the local irrigation district if the signs are not posted.

**STORAGE AND DISPOSAL**

Do not contaminate water, food or feed by storage or disposal.

**PESTICIDE STORAGE**

All containers of *AcroCide™H Herbicide* should be stored in a secured, well-ventilated area, away from all other chemicals at a temperature range between -40 C to 60 C. No alkalies or oxidizing materials may be near. Any electrical equipment should be Class 1 – Division 2 and properly grounded.

**PESTICIDE DISPOSAL**

Pesticide wastes are acutely hazardous. Improper disposal of excess pesticide, spray mixture, or rinsate is a violation of Federal Law. If these wastes cannot be disposed of by use according to label instructions, contact your State Pesticide or Environmental Control Agency, or the Hazardous Waste representative at the nearest EPA Regional Office for guidance.

**CONTAINER HANDLING**

Refillable container. Refill this container with *AcroCide™H Herbicide* only. Do not reuse this container for any other purpose. Return empty containers to Taft Manufacturing Company. Cleaning the container before final disposal is the responsibility of the person disposing the container. Cleaning before refilling is the responsibility of the refiller. For cleaning and residue removal of cylinders, follow the Standard Operating Procedure: TMC-140. For cleaning and residue removal of skids, follow the Standard Operating Procedure: TMC-141.

**NOTICE OF WARRANTY**

MULTICHEM MAKES NO WARRANTY OF MERCHANTABILITY FITNESS FOR ANY PURPOSE, OR OTHERWISE EXPRESSED OR IMPLIED concerning this product or its uses which extend beyond the use of the product under normal conditions in accord with the statements made on this label.

**multi-chem® Multi-Chem Group, LLC**  
3000 N. SAM HOUSTON PARKWAY EAST  
Houston, TX 77032

Emergency Contact Number (24 Hours Per Day): 1-866-519-4752 or 1-760-476-3962 Global Incident Response Access Code: 334305 Contract Number: 14012

# **AcroCide<sup>™</sup> H Herbicide Application and Safety Manual Revision Date: May 2, 2016**

For use with *AcroCide H Herbicide* (EPA Reg. No. 71173-2)

**THIS PRODUCT MUST BE ACCOMPANIED BY THE EPA-APPROVED  
PRODUCT LABEL AND THE EPA-APPROVED ACROCID<sup>™</sup> H  
HERBICIDE APPLICATION AND SAFETY MANUAL**

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**RESTRICTED USE PESTICIDE  
DUE TO A HIGH ACUTE TOXICITY**

**For retail sale to and use by Certified Applicators and only to  
those users covered by the Certified Applicator's certification**

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**This *AcroCide<sup>™</sup> H Herbicide Application and Safety Manual* is  
labeling. Read and understand the entire labeling and manual prior to  
use. All parts of the labeling and manual are equally important for safe  
and effective use of this product.**

**PLEASE SIGN AND RETURN**

The attached AcroCide™ H Herbicide Application and Safety Manual contains instructions for use concerning this label. Federal law requires that this manual be in the possession of the applicator. Please acknowledge receipt of this manual by signing and returning this page to the address listed below.

Multi-Chem Group, LLC  
3401 West Admiral Doyle Drive  
New Iberia, LA 70560

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Date

\_\_\_\_\_  
Title of Capacity

\_\_\_\_\_  
Firm or Organization

**RESTRICTED USE PESTICIDE**

FOR RETAIL SALE AND USE ONLY BY CERTIFIED APPLICATORS OR PERSONS UNDER THEIR DIRECT SUPERVISION AND ONLY FOR THOSE USES COVERED BY THE CERTIFIED APPLICATOR'S CERTIFICATION.

Manual Revision Date: May 2, 2016

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## *1.0 PURPOSE*

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This document outlines the field application protocols and procedures for the use and safe handling of AcroCide™ H Herbicide. This product is highly toxic. Therefore, the EPA has classified AcroCide™ H Herbicide as a RESTRICTED USE PESTICIDE for retail sale to, and use only by, certified applicators or persons under their direct supervision and only for those uses covered by the certified applicator's certification. The various states each have different requirements concerning record keeping for restricted use pesticides. Contact the appropriate agency in your state for further information.

**Application concentration requirements and other important information are detailed on the label that accompanies the product.** The certified applicator must comply with label requirements for all AcroCide™ H Herbicide applications.

## *2.0 SCOPE*

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This manual applies to all field applications of AcroCide™ H Herbicide.

## *3.0 RESPONSIBILITIES*

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All applicators of AcroCide™ H Herbicide must familiarize themselves with this manual and the accompanying label and follow all procedures and requirements in this manual and labeling.

AcroCide™ H Herbicide is a restricted use pesticide. All federal and state regulations relating to the use of restricted use pesticides must be followed by the applicator. Additionally, all applicators of AcroCide™ H Herbicide must successfully complete the appropriate level of training within the Certified Acrolein Technical Specialist (CATS) program.

#### 4.0 PHYSICAL AND CHEMICAL PROPERTIES OF ACROCIDE™

AcroCide™ H Herbicide is a formulation containing a nominal concentration of 96% (by weight) acrolein, the active ingredient. Typical physical and chemical properties are listed below:

Formula	CH <sub>2</sub> CHCHO
Molecular Weight	56.06
Color	Colorless
Physical state	Clear liquid
Odor	Pungent, burnt, sweet odor (extremely irritating)
Stability to normal/elevated temps, metals & metal ions	Stable at 54°C and not corrosive against iron chips, aluminum shot and aluminum acetate. Slightly corrosive against iron acetate at 54°C and prolonged contact.
pH	6.13 ± 0.03 for a 1% w/w solution at 22°C.
Viscosity	0.33 cP at 25°C
Melting point/melting range	-87.7°C
Boiling point/boiling range	53.0°C
Density/relative density/bulk density	0.845 g/mL at 23°C
Partition coefficient ( <i>n</i> -octanol/water)	0.12 ± 0.01 (log P <sub>ow</sub> )
Water solubility	214.89 ± 5.40 g/L
Vapor pressure	220 torr at 20°C

#### 5.0 PRECAUTIONARY STATEMENTS

##### 5.1 Hazards To Humans And Domestic Animals

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**DANGER** Extremely flammable and irritating vapor and liquid. Fatal if inhaled, absorbed through the skin, or swallowed. Do not breathe vapors or spray mist. Causes irreversible eye damage. Do not get in eyes, on skin, or on clothing. Keep away from fire, sparks, and heated surfaces.

### **PESTICIDE PROTECTION EQUIPMENT (PPE) REQUIREMENTS**

All certified applicators participating in the application during setting up and breaking down of application equipment and during visual inspection must wear:

- Coveralls over long-sleeved shirt and long pants,
- Shoes and socks,
- Chemical-resistant gloves,
- A NIOSH-approved full face respirator with either
  - Organic-vapor removing cartridges with a pre-filter approved for pesticides (MSHA/NIOSH approval number prefix TC-23C), or
  - A canister approved for pesticides MSHA/NIOSH approval number prefix TC-14G).

Respirator fit testing, training and medical qualification:

Employers must ensure that all AcroCide<sup>™</sup> H Herbicide handlers are:

- Fit-tested and fit-checked using a program that confirms to OSHA's requirements (see 29CFR part 1910.134)
- Trained using a program that confirms to OSHA's requirements (see 29CFR part 1910.134).
- Examined by a qualified medical practitioner to ensure physical ability to wear the style of respirator to be worn. A qualified medical practitioner is a physician or other licensed health care professional who will evaluate the ability of a worker to wear a respirator. The initial evaluation consists of a questionnaire that asks about medical conditions (such as heart condition) that would be problematic for respirator use. If concerns are identified, then additional evaluations, such as a physical exam, might be necessary. The initial evaluation must be done before respirator use begins. Handlers must be reexamined by a qualified medical practitioner if their health status or respirator style or use-conditions change.

### **USER SAFETY REQUIREMENTS**

If AcroCide<sup>™</sup> H Herbicide is spilled or leaked on clothing, gloves, or shoes, immediately remove them and wash thoroughly with soap and water.

Follow manufacturer's instructions for cleaning/maintaining PPE. If no such instructions for washables exist, use detergent and hot water. Keep and wash PPE separately from other laundry.

Discard clothing, gloves, shoes, and other absorbent materials that have come into contact with *AcroCide<sup>™</sup> H Herbicide*. Do not reuse them.



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## USER SAFETY RECOMMENDATIONS

Users should wash hands thoroughly with soap and water after handling and before eating, drinking, chewing gum, using tobacco, or using the toilet.

Users should remove PPE immediately after handling this product. Wash the outside of the gloves before removing. As soon as possible, wash thoroughly and change into clean clothing.

Liquid AcroCide H Herbicide is absorbed by the skin and is particularly irritating to any lesion and to the eyes. The vapor is highly toxic and a strong irritant (lachrymator) which acts principally on the mucous membranes of the eyes, nose, throat and lungs. The vapor concentration tolerable to humans (0.1-1 ppm in air) serves as a warning of its presence and is close to the concentration that can cause lung injury (2-4 ppm). If you can smell the vapor, or if you experience lung or eye irritation, move away from the area immediately. Inhalation of the vapor can result in serious, permanent injury to the lungs. Additional information is available in 'Appendix A'

The occupational exposure levels for acrolein, the active ingredient in AcroCide™ H Herbicide are shown in the table below.

### Occupational Exposure Levels for Acrolein

PEL (OSHA)	TLV (ACGIH)
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TWA	Ceiling
0.1 ppm	0.1 ppm

Symptoms of exposure to AcroCide™ H Herbicide: include irritation of the eyes, throat, and skin, reddening or blistering of the skin, headaches, acute distress in affected areas and cessation of breathing. There is no emergency antidote for AcroCide™ H Herbicide.

## ENGINEERING CONTROLS

Handlers must use a closed system that is designed by the manufacturer to prevent dermal and inhalation exposures by removing the product from the container and applying the product below the water's surface. At any disconnect point, the system must be equipped with a dry disconnect or dry couple shut-off device that will limit drippage to no more than 2 ml per disconnect. The closed system must function properly and be used and maintained in accordance with the manufacturer's written operating instructions. Handlers must wear the personal protective equipment required on this labeling.

## ENVIRONMENTAL HAZARDS

This pesticide is extremely toxic to fish and wildlife. Do not discharge effluent containing this product into lakes, streams, ponds, estuaries, oceans or other waters unless in accordance with the requirements of a National Pollutant Discharge Elimination System



(NPDES) permit and the permitting authority has been notified in writing prior to discharge. Do not discharge this product to sewer systems without previously notifying the local sewage treatment authority. For guidance contact your State Water Board or Regional Office of the EPA. Do not contaminate water when disposing equipment washwaters.

### PHYSICAL AND CHEMICAL HAZARDS

**DANGER:** Extremely flammable. Contents under pressure. Keep away from fire, sparks and heated surfaces. Do not puncture or incinerate container. Acrolein, the active ingredient in AcroCide™ H Herbicide, is highly reactive chemically and readily forms polymers. If alkalis (such as ammonia and caustic) or strong acids are brought in contact with *AcroCide™ H Herbicide* in a closed system, the biocide can polymerize with sufficient violence to rupture the container. Do not apply the equipment used for acids and alkalis. Contamination of *AcroCide™ H Herbicide* with any foreign matter must be avoided.

A supply of sodium carbonate (soda ash) and water should be readily available for deactivating spilled *AcroCide™ H Herbicide*. All spills should be confined and deactivated before disposal. See the *AcroCide™ H Herbicide* Application and Safety Manual for additional information.

## 5.2 First Aid

FIRST AID	
IF INHALED	<ul style="list-style-type: none"> <li>• Move person to fresh air</li> <li>• If person is not breathing, call 911 or an ambulance, then give artificial respiration, preferably mouth-to-mouth, if possible.</li> </ul>
IF ON SKIN	<ul style="list-style-type: none"> <li>• Take off contaminated clothing</li> <li>• Rinse skin immediately with plenty of water for 15-20 minutes.</li> </ul>
IF IN EYES	<ul style="list-style-type: none"> <li>• Hold eye open and rinse slowly and gently with water for 15-20 minutes.</li> <li>• Remove contact lenses, if present, after the first 5 minutes, then continue rinsing eye.</li> </ul>
IF SWALLOWED	<ul style="list-style-type: none"> <li>• Call a poison control center or doctor immediately for treatment advice.</li> <li>• Have person sip a glass of water if able to swallow.</li> <li>• Do not induce vomiting unless told to do so by the poison control center or doctor.</li> <li>• Do not give anything by mouth to an unconscious person.</li> </ul>
Call poison control center or doctor immediately for treatment advice. Have the product container or label with you when calling a poison control center, doctor, or going for treatment.	

### NOTE TO PHYSICIAN

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Probable mucosal damage may contraindicate the use of gastric lavage. Measures against circulatory shock, respiratory depression and convulsion may be needed.

**WARNING SIGNS AND SYMPTOMS:** Liquid *AcroCide™ H Herbicide* is absorbed by the skin and is particularly irritating to any lesion and to the eyes. The vapors act principally on the mucous membrane of the eyes and respiratory tract.

**TREATMENT:** Treat exposed areas as a chemical burn. Thoroughly flush eyes with water and treat symptomatically. Persons exposed to *AcroCide™ H Herbicide* vapors may have a delayed reaction and experience irritation of the respiratory tract. In severe cases, this may progress to pulmonary edema. Therefore, it is advisable to keep persons exposed to *AcroCide™ H Herbicide* under observation for 24 hours following exposure.

## ***6.0 PROPER HANDLING OF ACROCIDETM H HERBICIDE***

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### ***6.1 Information***

All persons handling *AcroCide™ H Herbicide* must be properly trained and certified in the correct application techniques and be familiar with its properties and emergency response procedures prior to performing an application. *AcroCide™ H Herbicide* spills can be deactivated using sodium carbonate (soda ash). Sodium carbonate (in powder form) should be added to the spill followed by dilution with water. This will polymerize the acrolein forming a hard, odorless polymer. The-deactivated polymer can then be placed in marked containers for disposal at an approved waste disposal facility. Never flush or allow spilled *AcroCide™ H Herbicide* to flow into sewers or natural waterways as this can result in biological upset of treatment systems, kill fish in waterways, or create a toxic hazard. Notify proper authorities as required by local regulations.

### ***6.2 Procedure for Handling Spills***

1. All personnel responding to a spill of *AcroCide™ H Herbicide* must have completed the appropriate training as outlined in 29 CFR 1910.120 (q), Emergency Response to Hazardous Substance Releases.
2. Evacuate all nonessential personnel to an upwind area.
3. All decontamination personnel must wear self-contained breathing apparatus (SCBA) and appropriate protective clothing.
4. Contain spill by diking with dirt.

- 
5. Add sodium carbonate (soda ash) to the spill in powdered form. Follow by dilution and mixing with water.
  6. When deactivation is complete, scoop the polymer in properly marked containers for disposal at an approved hazardous waste disposal facility in compliance with state and/or federal requirements.

### *6.3 Disposal*

Pesticide wastes are acutely hazardous. Improper disposal of excess pesticide, spray mixture, or rinsate is a violation of Federal law. If these wastes cannot be disposed of by use according to label instructions, contact your State Pesticide or Environmental Control Agency, or the Hazardous Waste representative at the nearest EPA Regional Office for guidance.

### *6.4 Fire and Polymerization Hazards*

AcroCide™ H Herbicide is a highly volatile liquid. In certain combinations with air (2.8 - 31% by volume) vapors have an explosive potential if ignition sources are present. Keep away from fire, sparks and heated surfaces. Liquid AcroCide™ H Herbicide is highly chemically reactive and readily forms polymers; this reaction generates tremendous heat. Contamination with alkalis or strong acids can initiate rapid polymerization. Contamination with all foreign materials must be avoided. If the product is stored or handled improperly, the polymerization may proceed with sufficient violence to rupture the container. AcroCide™ H Herbicide polymerizes slowly in the presence of air. Therefore, all containers are packaged with a blanket of nitrogen to exclude air. Hydroquinone is added to inhibit oxygen-catalyzed polymerization; however, hydroquinone does not inhibit polymerization catalyzed by alkalis and strong acids. To avoid the possibility of air contamination during use, AcroCide™ H Herbicide must only be pressured from the container with industrial grade nitrogen.

### *6.5 Fire Control*

Pursuant to local regulations, the 'appropriate fire department should be notified of the location where AcroCide™ H Herbicide is stored. AcroCide™ H Herbicide is highly flammable and produces toxic vapors. All firefighting personnel must wear self-contained breathing apparatus and protective clothing. On a small fire, use carbon dioxide or dry chemical extinguishers. Alcohol-type foam is recommended for large fires. Water spray may be effective if used in large quantities, at least 20 volumes of water per volume of AcroCide™ H Herbicide. Use water spray to help disperse vapors and cool containers. If container is heavily exposed to fire, evacuate area and let fire burn. For additional details, reference the acrolein Emergency Response Plan (ERP). A generic template is available to customers to assist in the development of their facilities ERP program. • Note: At elevated temperatures, such as in fire conditions, there is the possibility of violent rupture of AcroCide™ H Herbicide containers.

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## 6.6 *Process Safety Management*

Personnel should be aware of the requirements of OSHA Standard 1910.119, Process Safety Management of Highly Hazardous Chemicals. The major objectives of process safety management (PSM) of highly hazardous chemicals is to prevent unwanted releases of hazardous chemicals especially into locations which could expose employees and others to serious hazards. With regard to AcroCide<sup>TM</sup> H Herbicide, PSM applies to a process involving acrolein at or above the 150-pound threshold quantity. To ensure compliance, consult local, state and federal safety regulations.

## 6.7 *Personal Protective Equipment Use*

The applicator, to protect from an accidental splash or spray, must wear a full-face air purifying respirator, with organic vapor (OV) cartridges jointly approved by the Mine Safety and Health Administration (MSHA) and the National Institute of Occupational Safety and Health (NIOSH). and butyl rubber gloves.

Applicators must also have fresh water available in case of accidental irritation to the eyes or skin from AcroCide<sup>TM</sup> H Herbicide liquid or vapors. In addition, the applicator must have a ten (10) pound dry chemical fire extinguisher at his disposal when working with AcroCide<sup>TM</sup> H Herbicide. All of the equipment mentioned above must be provided for the applicator's use during each application. Personnel who may be involved with the storage, transportation, use, disposal or emergency response of AcroCide<sup>TM</sup> H Herbicide must be trained in the safety and health aspects of acrolein, including, but not limited to, the use of personal protective equipment, respiratory protection and emergency response as explained in the relevant OSHA standards.

## 6.8 *AcroCide<sup>TM</sup> H Herbicide Storage*

All containers of AcroCide<sup>TM</sup> H Herbicide should be stored in a secured, well-ventilated area, away from all other chemicals. No alkalis or oxidizing materials should be near. Any electrical equipment should be Class 1 - Division 2 and properly grounded. Do not reuse empty container. Return empty containers to Multi-Chem Group, LLC

If AcroCide<sup>TM</sup> H Herbicide is stored at a single location in quantities greater than 5,000 pounds net, a Risk Management Plan is required. To ensure compliance, consult local, state and federal regulations.

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## 6.9 Disposal

Pesticide wastes are acutely hazardous. Improper disposal of excess pesticide, spray mixture, or rinsate is a violation of Federal law. If these wastes cannot be disposed of by use according to label instructions, contact your State Pesticide or Environmental Control Agency, or the Hazardous Waste representative at the nearest EPA Regional Office for guidance.

## 7.0 DIRECTIONS FOR USE

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It is a violation of Federal Law to use this product in a manner inconsistent with its labeling.

Refer to *AcroCide™H Herbicide* label for directions for use.

*AcroCide™H Herbicide* is a water soluble material for the control of submersed and floating weeds and algae in irrigation canals. This material must be applied in accordance with directions in the *AcroCide™H Herbicide* Application and Safety Manual by a certified applicator or under a certified applicator's supervision. Do not permit dairy animals to drink treated water. Do not use where waters will flow into potential sources of drinking water. Water treated with *AcroCide™H Herbicide* must be used for irrigation of fields, either crop bearing, fallow or pasture, where the treated water remains on the field OR held for 6 days before being released into fish bearing waters of where it will drain into them.

One certified applicator must be present at the application site during the application. The applicator is to contact a member of their organization no less than every two hours during the course of an application. No handlers are allowed to participate in the application unless they are state certified (licensed) applicators and have completed the registrants training program within the last 12 months.

*AcroCide™ H Herbicide* applications must be made using a closed application system. All application equipment must be of a design approved by Multi-Chem Group, LLC. Application manifolds must be procured from a Multi-Chem Group, LLC approved vendor. Prior to disconnecting equipment following an application or when changing *AcroCide™ H Herbicide* containers the application system must be flushed with nitrogen to clear *AcroCide™ H Herbicide* residual from the injection line. Prior to removal of the *AcroCide™ H Herbicide* injection manifold attached to the *AcroCide™ H Herbicide* container, the *AcroCide™ H Herbicide* liquid manifold line should be cleared with pressurized nitrogen, thus forcing any liquid in this line back into the *AcroCide™ H Herbicide* container.

*AcroCide™ H Herbicide* treatment volumes vary depending on the following factors: degree of weed growth in the canal to be treated, water temperature, application time and water flow rate as measured in cubic feet per second (cfs).

Regardless of the factors listed above, the maximum application concentration of *AcroCide™ H Herbicide* can never exceed 15 ppm.

Maximum number of applications: 8 applications per year.  
Minimum retreatment interval: 2 weeks.

*AcroCide™ H Herbicide* application rate will increase with greater amounts of weed growth. The following application rates should be used based on the amount of weed growth in the canal.

- |  |                    |
|--|--------------------|
| 1. Pondweed less than 6" long and little algae     | 0.17 gallons / cfs |
| 2. Pondweed less than 12" long and submerged algae | 0.25 gallons / cfs |
| 3. Pondweed 12-24" long and algae                  | 0.50 gallons / cfs |
| 4. Pondweed over 24" long and algae                | 1.00 gallons / cfs |
| 5. Severe canal blockage                           | 1.50 gallons / cfs |

These applications rates should be increased when the water temperature is below 60° F. The following multiplication factors should be applied to the base application rate.

**Water Temperature**

Above 60° F	1.00
Between 55° F and 60° F	1.20
Between 50° F and 55° F	1.50
Below 50° F	2.00

*AcroCide™ H Herbicide* flow rates are adjusted by using orifice plates with various orifice diameters in combinations with various *AcroCide™ H Herbicide* container pressures. The table below details *AcroCide™ H Herbicide* flow rates in gallons per hour (gph) using different combinations of tank pressures and orifice plates.

**Flow Rate Table**

Orifice Diameter (inches)	<i>AcroCide™ H Herbicide</i> Tank Pressure									
	6 psig	8 psig	10 psig	15 psig	20 psig	25 psig	30 psig	40 psig	50 psig	60 psig
<i>AcroCide™ H Herbicide</i> Flow Rate (gph)										
<b>0.014</b>	0.65	0.72	0.85	1.05	1.2	1.3	1.4	1.6	1.9	2.1
<b>0.016</b>	0.85	0.98	1.05	1.3	1.5	1.7	1.9	2.2	2.4	2.6
<b>0.020</b>	1.3	1.5	1.6	2.1	2.4	2.7	2.8	3.3	3.7	4.0
<b>0.025</b>	2.1	2.3	2.6	3.2	3.7	4.1	4.5	5.1	5.9	6.3

<b>0.030</b>	2.8	3.3	3.7	4.6	5.3	5.9	6.4	7.3	8.5	9.2
<b>0.035</b>	3.9	4.5	5.1	6.2	7.2	7.9	9.2	10.5	11.1	12.5
<b>0.045</b>	6.4	7.0	8.5	10.5	11.8	13.1	14.2	16.5	18.5	21.0
<b>0.055</b>	9.8	11.1	12.4	15.0	17.0	20.0	22.0	25.0	27.0	30.0
<b>0.070</b>	15.0	17.0	21.0	25.0	28.0	32.0	35.0	40.0	46.0	49.0
<b>0.081</b>	21.0	24.0	27.0	33.0	38.0	42.0	47.0	53.0	60.0	65.0

Typical application time will range from 30 minutes to 8 hours. These contact times may be adjusted based on canal flow rate. In canals with water velocities greater than 2 miles per hour extended application times are preferable. In slower canals the application time should be shortened.

The maximum application concentration is 15 ppm. If an application volume versus time will result in a maximum concentration greater than 15 ppm the application time should be extended to result in a lower concentration over a longer period of time. *AcroCide<sup>TM</sup>H Herbicide* use will be restricted to eight (8) applications per application point per calendar year. An individual application point as defined, may consist of multiple treatments/releases within a contiguous irrigation canal, to ensure aquatic weed control throughout the entire irrigation canal or portion thereof.

### **POSTING OF APPLICATION EQUIPMENT AREA**

The Certified Applicator in charge of the application must post signs around the perimeter of the application equipment area (truck, hoses and skids). Signs must be no more than 15 feet apart and contain the following information:

- Skull and crossbones symbol
- DANGER/PELIGRO
- DO NOT ENTER/NO ENTRE: Pesticide Application/Aplicacion de Pesticidas
- The name of the product being applied
- The start date and time of application
- The end date and time of application
- The name, address and telephone number of the Certified Applicator in charge of the application

Signs must remain legible during the entire posting period and must be removed once the application is completed and no later than 3 days after treatment.

Applications with *AcroCide<sup>TM</sup>H Herbicide* may only be made in canals with posted no swimming signs. Contact the local irrigation district if the signs are not posted.



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## 8.0 OPERATING PROCEDURES

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Current, clearly written standard operating procedures (SOPs) and safe work practices ensure that employees (including contract employees) will operate in a safe, consistent and prescribed manner. Multi-Chem has developed a written operating procedures program to ensure that written procedures/practices are developed, reviewed, implemented, and certified as reflective of current plant practice.

The operating procedures are described in the following pages and include tasks specific to the equipment set-up and application of AcroCide™ H Herbicide including the following:

- Site assessment
- General Procedure Checklist
- Equipment inspection
- Equipment installation
- Leak detection
- Application
- Equipment clearing
- Equipment disassembly

The operating procedures are kept current and accurate through annual certification and management of change (MOC). The MOC procedure is also used to manage temporary operating procedures. The revised documents are routed to the appropriate EH&S supervisors for review and certification.

The procedures detailed in the following sections will guide you through typical AcroCide™ H Herbicide treatment applications. Refer to the Manifold Illustration on Page 16 for valve numbers and equipment descriptions mentioned in the detailed procedures.

### 8.1 Site Assessment

Prior to AcroCide™ H Herbicide being transported to the application site, a site inspection must be completed to assess the risk potential. The following must be considered:

- Personnel and public exposure potential in the event of a release
- Site security

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- Spacing requirements sufficient for application equipment (i.e. proximity of electrical panels, access for changing out skids or cylinders, etc.)
  - Location and suitability of application point
  - Proximity of surface water such as ponds, lakes, creeks, or rivers
  - Containment options in the event of a release
  - Water supply for clean-up in the event of a release
  - Weather conditions including prevailing wind direction

## 8.2 *Commitment to Safety*

AcroCide™ H Herbicide's primary ingredient, acrolein, is highly reactive and requires special handling and application expertise. Multi-Chem employees receive a comprehensive AcroCide™ H Herbicide treatment awareness training. Field personnel receive additional in-depth application training. Multi-Chem also provides training to customers to increase awareness of the proper application of AcroCide™ H Herbicide. In addition, all AcroCide™ H Herbicide applications are subject to unannounced audits to assure strict adherence to Health, Safety and Environment (HSE) procedures.

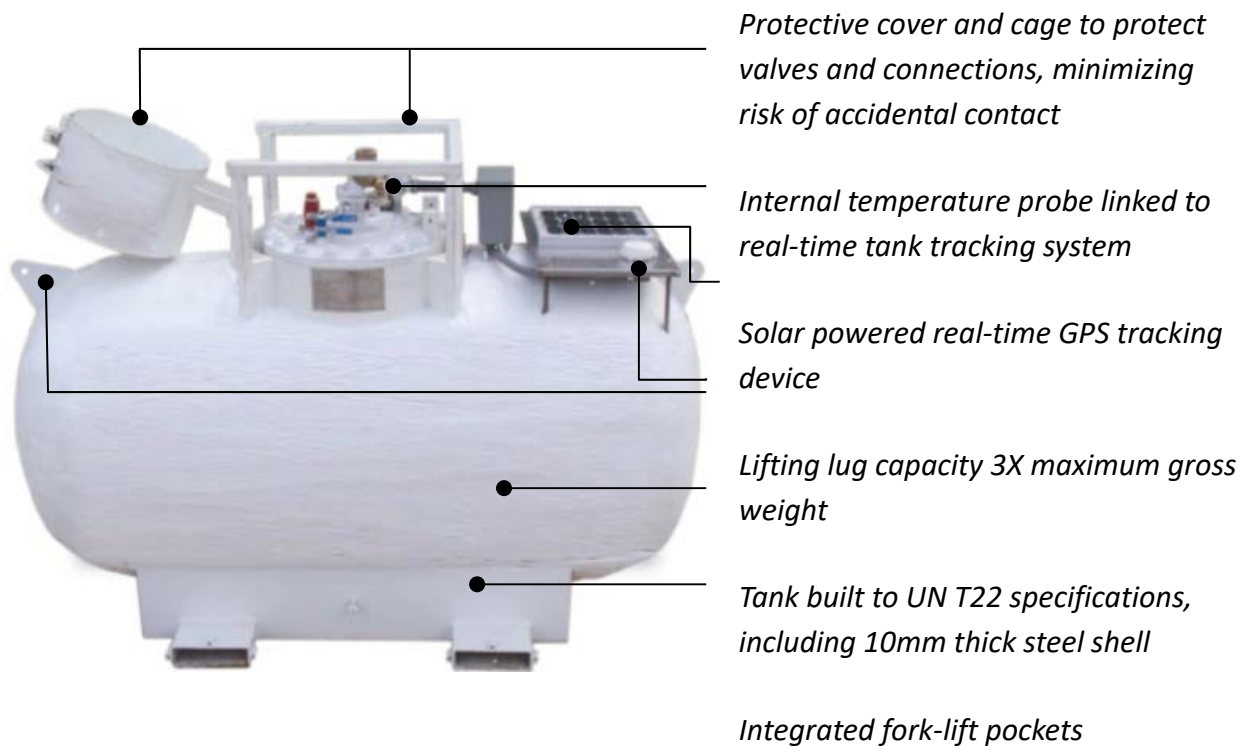
Acrolein, also known as acrylic aldehyde, allylaldehyde, propenal, 2-propenal, prop-2-enal, prop-2-en-1-al, is a volatile, colorless, highly flammable liquid at ordinary temperature and pressure with a pungent odor. Its Chemical Abstract Service (CAS) number is 107-02-8. The chemical formula for acrolein is C<sub>3</sub>H<sub>4</sub>O and the molecular weight is 56.06. Acrolein has a density of 0.84 g/mL, a water solubility of 206 g/L, and a vapor pressure of 29.3 kPa at 20°C. The log Kow (octanol/water partition coefficient) is -0.01 (high water solubility) and the log Koc (organic carbon/water partition coefficient) is 0.5 (low adsorption to soil) (WHO, 1991; U.S.EPA, 2003; ATSDR, 2007).

## 8.3 *Certified AcroCide™ Technical Specialist (CATS)*

AcroCide™ H Herbicide is handled only by certified Multi-Chem personnel. Select employees from each region are chosen to become CATS-candidates are highly technical and conscientious individuals with exemplary safety records. Once selected, CATS complete a comprehensive program of field and classroom training to obtain their AcroCide™ H Herbicide certification.

## 8.4 AcroCide™ Skid Tank

The patent pending AcroCide™ H Herbicide tank design from Multi-Chem incorporates a satellite based temperature monitoring system that detects any polymerization or contamination of the product. In the event of a temperature excursion, the GPS transmitter immediately notifies key Multi-Chem response personnel. The AcroCide™ H Herbicide field tanks are built to meet extremely high quality standards.



## 8.5 AcroCide™ Cylinder



Protective cover and cage to protect valves and connections, minimizing risk of accidental contact

Tank built to UN T22 specifications, including 10mm thick steel shell

## 8.6 Acrolein Tank Maintenance

All AcroCide™ H Herbicide skids and cylinders are subject to inspection each time tank is returned to Denver City Plant from the field. The following flow chart should be utilized for the maintenance process. Anytime a tank is flushed, filled, opened, valves or rupture disks replaced or repairs to GPS system are made, activity should be noted in the tank activity log.

## 8.7 General Procedure Check List for AcroCide™ H Herbicide Applications

### 8.7.1 Pre-Job Equipment Check

#### Nitrogen Regulator

- (Qty 1) – check valve
- (Qty 1) – excess flow valve

#### Inlet nitrogen manifold

- (Qty 2) – check valves

#### Outlet liquid manifold

- (Qty 4) – check valves

#### Injection stinger/quill

- (Qty 2) – check valves

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### *8.7.2 Pre-Job Safety Meeting*

- JSA
- Roles and Responsibilities

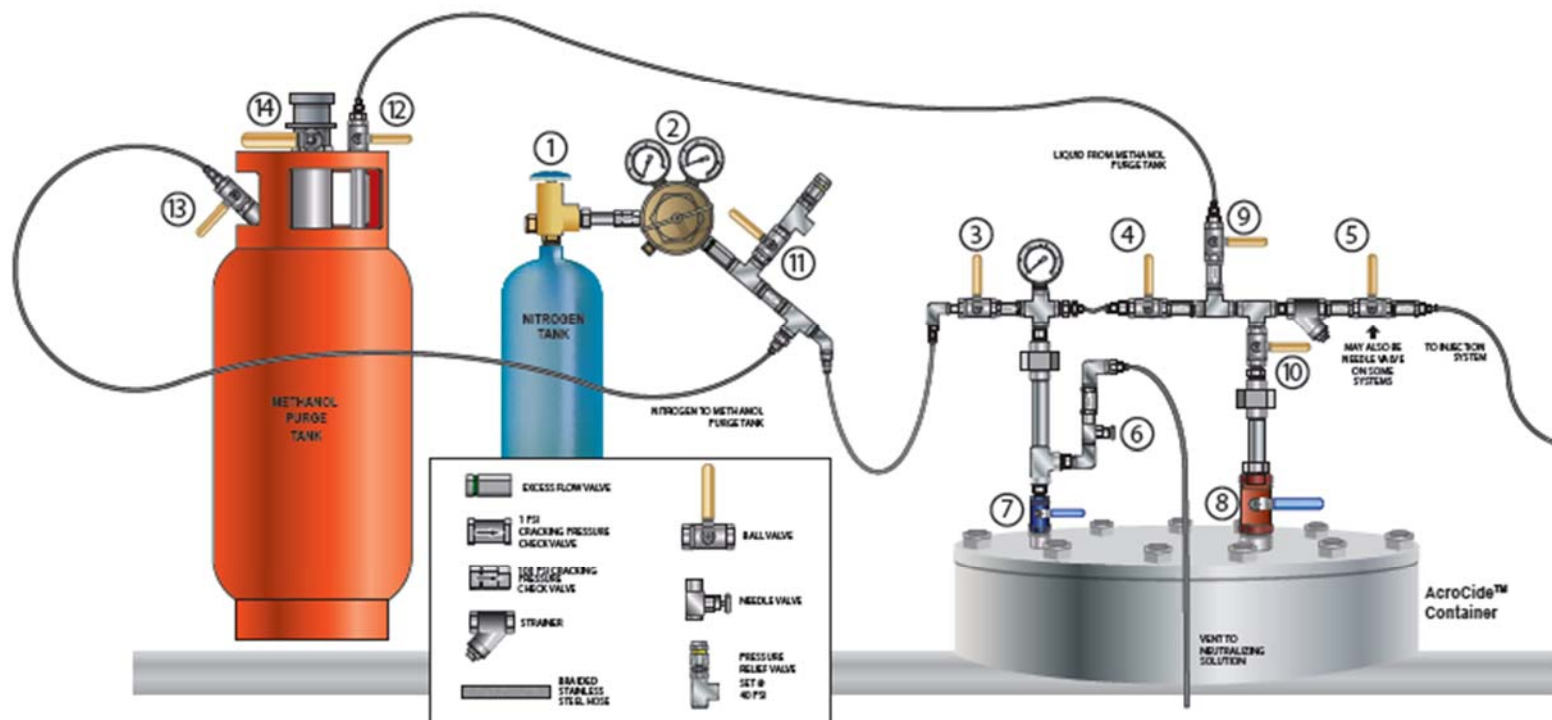
### *8.7.3 Continuous Application Equipment Set-up*

- Evacuate non-essential personnel
- Install nitrogen regulator, inlet nitrogen manifold, outlet liquid manifold, injection stinger, and all hoses as per established procedure
- Pressure test and leak test all connections as per established procedure
- Use methanol purge tank to displace nitrogen from manifold and pump suction supply line and to prime the chemical pump
- To change AcroCide<sup>™</sup> H Herbicide skid or tank, purge manifold using methanol and nitrogen as per established procedure

### *8.7.4 Batch Application Equipment Set-up*

- Evacuate non-essential personnel
- Install nitrogen regulator, inlet nitrogen manifold, outlet liquid manifold, injection stinger, and all hoses as per established procedure
- Pressure test and leak test all connections as per established procedure
- Instruct pressure truck to begin pumping water and establish stable desired rate
- Determine desired AcroCide<sup>™</sup> H Herbicide rate based on stable truck pumping rate
- Initiate AcroCide<sup>™</sup> H Herbicide flow and set to desired rate
- When desired amount of AcroCide<sup>™</sup> H Herbicide has been applied, shut nitrogen and liquid valves on skid/cylinder tank
- Warn pressure truck driver that nitrogen purge is about to begin
- Purge manifold and equipment with methanol followed by nitrogen as per established procedures
- Once purge is complete, close all application valves and allow pressure truck to complete overflush water application
- Once pressure truck is finished, evacuate non-essential personnel, and disconnect all equipment as per established procedures

Container Mount AcroCide™ Application Manifold



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## ***8.8 Equipment Inspection***

### ***8.8.1 Nitrogen Pressure Regulator Inspection***

The nitrogen pressure regulator assembly should be inspected prior to installation each time a nitrogen bottle is connected to an acrolein application system.

### ***8.8.2 AcroCide™ H Herbicide Application Manifold Inspection***

This inspection procedure should be conducted prior to initial installation and each time the AcroCide™ H Herbicide container is changed.

## ***8.9 Equipment Installation***

*Be sure to use a back-up wrench on the valve bodies on the AcroCide™ H Herbicide tank to prevent valves from rotating when connecting and disconnecting equipment to the tank.*

### ***8.10 Leak Detection***

Prior to starting any AcroCide™ H Herbicide application each connection should be tested for leaks. Leak detection of the manifold system should also be done each time an AcroCide™ H Herbicide container is changed. All leak detection should be done with nitrogen pressure and should use “Simple Green” soap for visual detection of leaks. Simple Green diluted at 10% in water has been tested for compatibility with acrolein and has been found to be safe to use with this product. Many other soaps and leak detection liquids are not compatible with acrolein and should not be used for leak detection. You should also listen for leaks – large leaks may not be detected using Simple Green soap solution, but may be heard. The general process of leak detection is to sequentially apply pressure to isolated sections of the application equipment and spray a fine mist of the Simple Green soap solution on each connection. If a small leak is present you will see small bubbles for at the leak site. Larger leaks may be detected by sound. Each time a leak is detected it should be repaired before moving on to the next part of the system. Maximum delivery pressure of the pressure regulator (80 psig) should be used for all leak detection steps.

- 1) Close all valves on the nitrogen tank, pressure regulator, application manifold, acrolein tank, pump, pump bypass system, and injection line.
- 2) Open Valve 1 and set Valve 2 to deliver 80 PSI. Ensure Valve 11 below PRV valve is closed or nitrogen will escape.



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- 3) Apply Simple Green solution to all connections between Valve 1 and Valve 3. Inspect for leaks and make repairs as necessary.
  - 4) Open Valve 3 and apply soap to all connections between Valve 3, Valve 4, Valve 7, and Valve 6. Inspect for leaks and make repairs as necessary.
  - 5) Open Valve 4 and Valve 10 and apply soap to all connections between Valve 4, Valve 5, and Valve 8. Inspect for leaks and make repairs as necessary.
  - 6) Open Valve 5 and apply soap to all connections between Valve 5 and the next valve in the system. Inspect for leaks and make repairs as necessary.
  - 7) Continue this inspection process to the injection point if using a GPI flow meter. If using a Neptune pump, open the pump suction valve and discharge valve to continue the leak detection process to the injection point.
  - 8) Open the injection point valve for 1 – 2 minutes to allow nitrogen to flow through the GPI flow meter or the Neptune pump to purge air from the system. Close the injection point valve.
  - 9) Open Valve 6 slowly to purge air from vapor manifold prior to application.
  - 10) While Valve 6 is open, set Valve 2 to deliver 20 PSI.
  - 11) Close Valve 6.
  - 12) Close all valves on application system.
  - 13) Open Valve 11 on nitrogen regulator assembly.

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## 8.11 Application

### 4.12.1 General Procedure for Application

The following procedure is for a continuous application or a batch application. The procedures may need to be slightly modified for some applications.

- 1) Follow “*Equipment Inspection*” procedures.
- 2) Follow “*Equipment Installation*” procedure.
- 3) Follow “*Leak Detection*” procedure.
- 4) Apply product according to job requirements.

## 8.12 Equipment Clearing

### 8.12.1 Procedure for Equipment Clearing Utilizing a Neptune Pump Package

When the application has been completed and prior to disassembly of the application equipment the equipment should be cleared of liquid acrolein as thoroughly as possible. This is best accomplished by utilizing the methanol purge tank and nitrogen.

- 1) Close Valve 7, Valve 8, and Valve 10.
- 2) Ensure the methanol purge tank is filled with uninhibited methanol (SS-5189).
- 3) If the methanol purge tank is not already connected, proceed as follows. Otherwise skip to Step 4.
  - a. Close Valve 1 and Valve 3.
  - b. Carefully remove cap from unused ¼” FJIC fitting on nitrogen manifold; be aware that there will be nitrogen pressure behind the cap.
  - c. Attach a ¼” stainless steel braided hose from the nitrogen regulator manifold second fitting to the inlet on the methanol purge tank.
  - d. Attach another ¼” stainless steel braided hose from the outlet of the methanol purge tank to Valve 9 on the liquid manifold.
  - e. Open Valve 1 and Valve 3.
- 4) Close Neptune pump suction valve.

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- 5) Attach ¼” stainless braided hose to valve on top of sight glass and route to pail of saturated soda ash solution. *Secure hose in pail to prevent it from blowing out of pail.*
  - 6) Ensure vent hose is inserted below soda ash liquid level!**
  - 7) Ensure soda ash pail has sufficient venting to prevent over-pressuring during nitrogen purging!**
  - 8) Carefully open valve on bottom sight glass valve then valve on top of sight glass to allow purging into soda ash solution.
  - 9) Make sure Valve 3 and Valve 5 are open.
  - 10) Ensure Valve 1 is open and adjust Valve 2 to deliver 5 – 10 PSI greater than the application pressure that was used.
  - 11) Carefully open Valve 4 for 30 – 60 seconds. *Ensure hose from top of sight glass to soda ash pail is secure.*
  - 12) Close Valve 5 then close the valve both bottom and top sight glass valves.
  - 13) Open Valve 10 and then cycle Valve 8 fully open and closed at least 3 times to force the liquid Acrolein in the riser back into the Acrolein tank.
  - 14) Close Valve 10.
  - 15) Close Valve 8 and install carabiner latch.
  - 16) Close Valve 4.
  - 17) *This is sufficient purging to allow for removal of the application manifold from the skid tank to allow for placement of a new skid tank and immediate re-connection for continued application.***
  - 18) Close all valves.
  - 19) If the AcroCide™ H Herbicide tank is empty, the pressure on the tank prior to returning it to Denver City must be 15 – 20 PSI. If it is between 15 – 20 PSI, skip to Step 22; otherwise continue to Step 20.
  - 20) Open Valve 7.
  - 21) Slowly open Valve 6 and vent vapor into the soda ash solution until the pressure in the AcroCide™ H Herbicide tank is down to 15 PSI.
  - 22) Close Valve 7 and install carabiner latch.
  - 23) Close Valve 6.

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### 8.12.2 Procedure for Equipment Clearing Utilizing Nitrogen Displacement

When the application has been completed and prior to disassembly of the application equipment the equipment should be cleared of liquid acrolein as thoroughly as possible. This is best accomplished by utilizing the methanol purge tank and nitrogen.

- 1) Close Valve 7, Valve 8, and Valve 10.
- 2) Ensure the methanol purge tank is filled with uninhibited methanol (SS-5189).
- 3) If the methanol purge tank is not already connected, proceed as follows. Otherwise skip to Step 4.
  - a. Close Valve 1 and Valve 3.
  - b. Carefully remove cap from unused ¼" FJIC fitting on nitrogen manifold; be aware that there will be nitrogen pressure behind the cap.
  - c. Attach a ¼" stainless steel braided hose from the nitrogen regulator manifold second fitting to the inlet on the methanol purge tank.
  - d. Attach another ¼" stainless steel braided hose from the outlet of the methanol purge tank to Valve 9 on the liquid manifold.
  - e. Open Valve 1 and Valve 3.
- 4) Ensure Valve 3, Valve 5, and all other valves downstream of Valve 5 are open including the injection point valve.
- 5) Ensure Valve 1 is open and adjust Valve 2 to deliver 5 – 10 PSI greater than the application pressure that was used.
- 6) Open Valve 4 for 30 – 60 seconds.
- 7) Close Valve 5.
- 8) Open Valve 10 and then cycle Valve 8 fully open and closed at least 3 times to force the liquid Acrolein in the riser back into the Acrolein tank.
- 9) Close Valve 10.
- 10) Close Valve 8 and install carabiner latch.
- 11) Close Valve 4.
- 12) Open Valve 5.
- 13) Open the inlet and outlet valves on the methanol purge tank.

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- 14) Open Valve 9, this will purge the AcroCide™ H Herbicide from the liquid line to the injection point.
  - 15) Once the methanol tank is empty, close Valve 9 and both valves on the methanol purge tank.
  - 16) Open Valve 4 and allow nitrogen to displace methanol from the injection lines into the system being treated.
  - 17) Once the methanol is purged from the injection lines, “walk” the stainless steel braided line all the way to the injection point to remove liquid traps and close the injection point valve.
  - 18) Slowly open discharge valve at injection quill and vent vapor into the soda ash solution until there will be no pressure in the lines. Close Valve 4 and Valve 5.
  - 19) Close all valves.
  - 20) If the AcroCide™ H Herbicide tank is empty, the pressure on the tank prior to returning it to Denver City must be 15 – 20 PSI. If it is already between 15 – 20 PSI, skip to Step 23; otherwise continue to Step 21.
  - 21) Open Valve 7.
  - 22) Slowly open Valve 6 and vent vapor into the soda ash solution until the pressure in the AcroCide™ H Herbicide tank is down to 15 PSI.
  - 23) Close Valve 7 and install carabiner latch.
  - 24) Close Valve 6.

### ***8.13 Equipment Disassembly***

***Be sure to use a back-up wrench on the valve bodies on the AcroCide™ H Herbicide tanks to prevent valves from rotating when connecting and disconnecting equipment to the tank; this could cause leaks that cannot be resolved in the field!***

#### ***8.13.1 Equipment Disassembly Utilizing a Neptune Pump Package***

This procedure is to be utilized only for a skid change-out and immediate re-connection for continued application!

- 1) Ensure all valves are closed.
- 2) Carefully disconnect nitrogen hose from vapor manifold near Valve 3; be aware that nitrogen pressure may still be present.
- 3) Disconnect by-pass hose from Valve 4; be aware that nitrogen pressure may still be present.

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- 4) Disconnect vent hose from Valve 6.
  - 5) Remove vapor manifold from skid tank and set aside in a clean area.
  - 6) Apply Teflon tape to blue ½” plug and install in Valve 7.
  - 7) Disconnect methanol hose from Valve 9.
  - 8) Disconnect union on liquid manifold below Valve 10; be aware that nitrogen pressure may still be present.
  - 9) Carefully set aside liquid manifold in a safe clean area. Leave liquid hose connected to Valve 5.
  - 10) Remove riser nipple from Valve 8 and set aside in clean area.
  - 11) Apply Teflon tape to red 1” plug and install in Valve 8.
  - 12) Remove empty skid tank and place new skid tank in location.
  - 13) Re-install vapor manifold on new skid tank; connect nitrogen hose to Valve 3 and vent hose to Valve 6.
  - 14) Re-install liquid manifold on new skid tank; connect by-pass hose to Valve 4 and methanol hose to Valve 9.
  - 15) Follow “*Leak Detection*” procedure, Section 4.7.
  - 16) Start with all valves in the closed position on the application manifold, AcroClear tank, injection line, pump, and nitrogen system.
  - 17) Open Valve 1 and set Valve 2 to deliver the desired nitrogen pressure. Typically 15 – 20 PSI is all that will be needed to feed the suction of a pump. Exceeding 40 PSI will cause nitrogen to vent from the PRV. Ensure Valve 11 is open.
  - 18) Ensure pump suction and all sight glass valves are closed.
  - 19) Install a ¼” stainless steel braided vent hose on the check valve side on the top of the sight glass and route to a pail with saturated soda ash solution.
  - 20) Open the inlet (vapor) valve on the methanol purge tank to pressurize with nitrogen.
  - 21) Open the outlet (liquid) valve on the methanol purge tank, then Valve 9, Valve 10, and Valve 5 to allow methanol to reach the pump suction valve. **Do not open Valve 8!**
  - 22) Slowly open the bottom sight glass valve. Methanol may start to fill the sight glass.

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- 23) Slowly open the top sight glass vent valve to allow nitrogen to vent to the soda ash pail. It may be necessary to allow some methanol to exit the top of the sight glass to allow all the nitrogen bubbles to leave the hoses.
  - 24) Once nitrogen bubbles stop entering the sight glass, close the top and the bottom sight glass valves.
  - 25) Open valve at injection point and then the pump discharge valve and the bottom sight glass valve. The level of the sight glass should not drop due to the 50 PSI pump discharge check valve. If the sight glass level drops, either the 50 PSI pump discharge valve is malfunctioning or the nitrogen regulator pressure is set too high.
  - 26) Reset pump stroke and speed to desired settings to achieve previous rate; then start pump.
  - 27) Monitor sight glass to confirm pump is operating properly; *do not let sight glass go empty*.
    - a. If pump is not operating properly it may be vapor locked; it may be necessary to repeat the full pump priming steps in Section 4.8.1.
    - b. If pump appears to be operating properly, proceed to Step 30 below.
  - 28) Shut-off pump and close bottom sight glass valve, Valve 9, and both valves on methanol purge tank.
  - 29) Open the following valves in sequence: Valve 3, Valve 7, and Valve 8.
  - 30) Start the pump. Verify pump is operating properly and confirm application rate using sight glass.
  - 31) If may be necessary to follow the *“Procedure for Applications Using a Neptune Pump Package”* in Section 4.8.1 to remove nitrogen and re-prime the pump.

### ***8.13.2 Equipment Disassembly for Applications Utilizing Nitrogen Displacement***

- 1) Carefully disconnect all hoses from application manifold, nitrogen pressure regulator, and downstream injection equipment; be aware that equipment may still have trapped nitrogen pressure. Carefully coil hoses to prevent damage and install plugs to prevent contamination.
- 2) The vent line should be stored separately from the other application equipment to prevent contamination of the equipment with soda ash.
- 3) Disconnect the union on the liquid manifold.
- 4) Remove riser nipple from liquid valve. Reassemble union on liquid manifold, install caps and plugs, and place manifold in storage case.
- 5) Remove vapor manifold, install caps and plugs, and place in storage case.



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- 6) Apply suitable Teflon tape to AcroCide™ H Herbicide tank plugs and install into both valves on tank.
  - 7) Once plugs are installed in AcroCide™ H Herbicide tank valves.
  - 8) Remove nitrogen regulator from nitrogen tank and install cap on nitrogen bottle. Install caps on nitrogen manifold and place in storage case.
  - 9) All ancillary equipment such as sight glass, flow meter, pump, etc. should have plugs installed in any openings prior to transport or storage.
  - 10) Carefully depressurize methanol purge tank through nitrogen inlet valve.

## ***9.0 TRANSPORTING ACROCIDE™ H HERBICIDE CONTAINERS***

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Transportation of hazardous chemicals is regulated by the U. S. Department of Transportation (DOT). The DOT requirements for transporting AcroCide™ H Herbicide (acrolein, inhibited) are as follows:

1. Transporting vehicle must be placarded when hauling full, partial or empty containers. Required placards are Inhalation Hazard 1092 and Flammable Liquid, available at cost through Multi-Chem Group, L.L.C. All four sides of the transporting vehicle must have placards displayed. with the 1092 placards (primary hazard) in left or upper position.
2. Driver must carry correct shipping papers at all times. These must include the correctly worded bill-of-lading supplied by Multi-Chem Group, L.L.C. or commercial freight line, material safety data sheet for AcroCide™ H Herbicide, and Chemtrec emergency response information (supplied with bill-of-lading).
3. Special drivers license requirements are in effect for transporting hazardous materials. For details, contact the Department of Motor Vehicles in your state.

Bills-of-lading for transportation of empty containers are available from your Multi-Chem Group, L.L.C representative.

## ***10.0 RETURN OF EMPTY ACROCIDE™ H HERBICIDE CONTAINERS***

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Empty containers are to be returned, freight collect, to:

Multi-Chem Group, L.L.C.  
13858 Hwy 92

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Maurice, LA 70555

Please Note: No partly used containers should be returned to Multi-Chem Group, L.L.C without prior notification. For information concerning the return of partly used containers, contact:

Multi-Chem Group, L.L.C  
Telephone: [number]  
E-mail address: [Email]

Normally, no credit will be issued for unused material returned from opened cylinders or skid tanks.

### *10.1 A. Preparation for Shipment of Empty Containers*

Prepare empty containers for shipment as follows:

1. Relieve container pressure down to 15-25 psig. This is normally accomplished by venting into the irrigation system during treatment.
2. Replace plugs in the inlet and outlet valves and tighten securely.
3. Fasten down valve handles securely.
4. Close lid and secure with latch.
5. Containers must be transported upright. Alert the carrier to secure containers to prevent overturning during transport.

The DOT has special shipping paper requirements for shipment of empty containers which previously contained a hazardous material. Properly worded bills-of-lading for empty containers are available through your technical sales representative. Trucks transporting empty containers must be placarded. It is the responsibility of the shipper to provide necessary placards.

## *11.0 NOTICE OF WARRANTY*

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MULTICHEM MAKES NO WARRANTY OF MERCHANTABILITY FITNESS FOR ANY PURPOSE, OR OTHERWISE EXPRESSED OR IMPLIED concerning this product or its uses which extend beyond the use of the product under normal conditions in accord with the statements made on this label.

## APPENDIX A: TOXICITY

Results of toxicological studies are summarized below:

The acute oral toxicity (LD50) of AcroCide™ H Herbicide for rats is approximately 29 mg/kg. The acute dermal LD50 of undiluted AcroCide™ H Herbicide in rabbits is 231.4 mg/kg.

In a subacute study conducted with male and female rats for 90 days, AcroCide™ H Herbicide was added to the drinking water at 0, 5, 13, 32, 80, and 200 ppm. Growth of both sexes was equal or better than the controls. Food efficiency was equivalent to the controls at all levels. Water consumption was reduced by 1/3 at the 200 ppm level for the first 3 weeks, but by the 12th week the animals had apparently adapted to the odor and taste of the AcroCide™ H Herbicide in the drinking water. There were no hematological, organ weight or pathological changes that could be attributed to the ingestion of the drinking water containing the AcroCide™ H Herbicide.

In a study of skin absorption, rabbits were immersed, except for the head, for one hour in 20 or 100 ppm aqueous solutions of AcroCide™ H Herbicide. There was no adverse effect at 20 ppm. At 100 ppm, one rabbit appeared weakened, but returned to normal in 24 hours.

Lactating dairy cows were given AcroCide™ H Herbicide in their drinking water at levels of 30, 60, or 90 ppm for 24 hours. There were no adverse effects at 30 and 60 ppm on body weight, water intake, feed and water consumption, and milk and butterfat production. No off-flavor was imparted to the milk. At 90 ppm, the only noticeable effect was 1/4 - 1/3 drop in water and hay consumption with a transitory drop in weight. However, all factors measured returned to normal the following day.

Data on vapor toxicity show that AcroCide™ H Herbicide vapor exerts its main action on the eyes and mucous membranes of the respiratory tract; severe exposure may produce serious injury to the lungs. A table of sensory response values is given below.

Atmospheric Concentration (ppm)	Duration of Exposure	Probable Human Response
0.25	5 minutes	Moderate irritation
1.0	5 minutes	Painful irritation
1.0	2 - 3 minutes	Eye and nose irritation
5.5	20 seconds	Painful eye and nose irritation
5.5	1 minute	Practically intolerable
153.0	10 minutes	May be fatal

The odor threshold for acrolein will vary among humans, depending upon the olfactory sensitivity and acuteness. Detection threshold will vary between 0.02 and 1.8 ppm.<sup>1</sup>

<sup>1</sup> Carson, B. L., Beall, C. M., Ellis, H. V., Baker, L. H. and Herndon, B. L., Acrolein Health Effects. U. S. Environmental Protection Agency (US EPA), EPA-460/3-81-034, NTIS PB82-161282, 1-121, September 1981.

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## APPENDIX B: TOXICITY, ENVIRONMENTAL FATE, AND CROP TOLERANCE INFORMATION

Results of representative studies are summarized below:

### A. Toxicity

Numerous studies have been conducted on AcroCide™ H Herbicide to support the registration of this product. The testing has been conducted according to government testing protocols using good laboratory practices (GLP) techniques. Testing of products normally begins with short term studies and progresses to longer term or lifetime studies. Acute (or short term exposure at relatively high doses) testing reveals the immediate hazards of a product while chronic (or long term exposure at lower doses) toxicity testing reveals the potential long term hazards of a product. For AcroCide™ H Herbicide, the acute oral toxicity (LD50) for rats is approximately 29 mg/kg. The acute dermal LD50 (24 hour exposure) of undiluted AcroCide™ H Herbicide in rabbits is 231.4 mg/kg. In a study investigating skin irritation (rabbits, 4 hour exposure) at 15 ppm aqueous solution of AcroCide™ H Herbicide, there were no signs of irritation at the concentration tested.

Data on vapor toxicity show that AcroCide™ H Herbicide vapor exerts its main action on the eyes and mucous membranes of the respiratory tract; severe (acute) exposure may produce serious injury to the lungs. The odor threshold for acrolein will, vary among humans, depending upon the olfactory sensitivity and acuteness. Detection threshold will vary between 0.05 and 0.4 ppm. Adverse health effects have been shown to occur in humans at concentrations as low as 0.09 ppm. Serious irreversible health effects may occur in humans at concentrations as low as 0.4 ppm for 10 minutes. OSHA does not allow workers to be exposed to concentrations over 0.3 ppm for longer than 15minutes. Additionally, the 8-hour workplace standard is 0.1 ppm and the IDLH is 2.0 ppm.

AcroCide™ H Herbicide has been investigated for its potential to cause carcinogenic tumors or lesions. A series of studies were conducted including a 12-month chronic toxicity test in dogs, where the highest dose (2 mg/kg) tested resulted in changes in blood chemistry, but no compound-related tumors or lesions. An 18- month oncogenicity study in mice did not reveal any compound-related tumors or lesions; the highest dose tested (4.5 mg/kg) resulted in increased mortality in the test group. A 24-month chronic toxicity/oncogenicity study in rats also did not reveal any compound-related tumors or lesions. The high dose, 2.5 mg/kg caused an increased mortality in the test group.

AcroCide™ H Herbicide has been tested for developmental and reproductive health effects. Results from developmental studies indicated AcroCide™ H Herbicide did not cause teratogenic effects on rats or rabbits at doses that caused maternal toxicity. A two-generation reproductive study in rats did not reveal any evidence of reproductive toxicity in either sex at any treatment level (maximum dose = 7.2 mg/kg).

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## Reducing the Potential to Wildlife Exposures

On an acute exposure basis, AcroCide™ H Herbicide is very highly toxic to freshwater fish and invertebrates, estuarine/marine invertebrates and it is highly toxic to estuarine/marine fish. Chronic exposure to AcroCide™ H Herbicide has resulted in reduced growth and survival in fish and reduced, survival in aquatic invertebrates. AcroCide™ H Herbicide will kill fish at levels significantly lower than levels required for treating aquatic weeds.

It is imperative that you minimize the potential impact on non-target aquatic organisms. Some ways to reduce the potential risk are:

- Do not use AcroCide™ H Herbicide where fish are considered a resource
- Eliminate entrance of fish to canals with fish screens or other barriers
- In the event of inadvertently exposed organisms, prevent release from the irrigation system
- Do not allow dead fish back into rivers or other natural waterways
- Limit the possible contamination of natural fish-bearing waters through the potential release of acrolein-treated canal water, by adhering to the following label statement:  
*"Water treated with AcroCide™ H Herbicide must be used for the irrigation of fields, either crop-bearing, fallow or pasture, where the treated water remains on the field OR must be held for 6 days before being released into fish bearing waters or where it will drain into them."*

and utilize the following examples to ensure product degradation before release:

- Irrigate the treated water directly onto crops,
- Hold the treated water in the canal, or
- Recirculate the treated water through the irrigation system (if system is so designed)

## B. Environmental Fate

A field study was conducted (Kern County, California, U.S.) to directly measure levels of AcroCide™ H Herbicide during application and subsequent irrigation of treated water across various fields utilizing different irrigation methods. Two test sites were selected, one utilizing furrow irrigation and the other flood irrigation. AcroCide™ H Herbicide residuals were monitored from the initial time of application until the point of dissipation across the irrigated field. In both cases, active 'acrolein levels dropped below detectable levels within several hundred feet when treated water was used to irrigate dry ground. This was true for both furrow and flood-irrigated fields.

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Numerous field dissipation studies have been conducted to determine the half-life and lifetime of AcroCide™ H Herbicide in irrigation systems. AcroCide™ H Herbicide dissipates rapidly in irrigation systems and the half-life (time required for the concentration to be reduced by one half) and lifetime (time required for concentration to degrade to levels below detection limits) are determined by factors such as weed density, water temperature and quality, system design, etc. The lifetime of AcroCide™ Herbicide has been found to range from 6 to 45 hours. Examples of study results include California canals where AcroCide™ H Herbicide was applied to aquatic weed infested and weed free canals at initial concentrations of 15 ppm for one hour. The half-life of acrolein was measured to be 7.5 hours in the nonweedy canal and 10 hours in the weed infested canal. In an Arizona field dissipation study, the half-life of acrolein was measured to be approximately 8 hours, and in a Washington study, the half-life of acrolein was measured to be 10.2 hours. Once low concentrations are reached, dissipation is not a linear function; instead an exponential (rapid) decline occurs.

In a field study conducted in Argentina, it was concluded that the use of AcroCide™ H Herbicide in the CORFO-Rio Colorado irrigation canals was considered to be ecologically acceptable. At recommended treatment concentrations most aquatic populations were depleted; however, even after several reductions recovery mechanisms were observed. These results were not significantly different from effects observed in mechanically cleaned canals.

The aerobic aquatic metabolism of 14C-acrolein, applied at the maximum treatment rate (15 ppm), was studied using sediment and water. The pattern of decline of acrolein in the water phase indicated that acrolein rapidly degrades in a natural water system. Results of this study indicated that hydration was an early step in acrolein degradation, with the acrolein undergoing rapid hydrolysis and biodegradation in water. The final degradation product was carbon dioxide.

In studies conducted to determine the aerobic soil metabolism for AcroCide™ H Herbicide, it was determined that the half-life of acrolein was 4.2 hours. The AcroCide™ H Herbicide irreversibly binds to the organic material in the soil and degrades to carbon dioxide. Baker Petrolite has also conducted metabolism studies in freshwater fish, shellfish, goats, hens, rats, and leaf lettuce all of which indicate AcroCide™ H Herbicide is rapidly metabolized into naturally occurring products and does not accumulate in the tissues.

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The studies mentioned above clearly show that acrolein rapidly degrades in the irrigation canals and when applied to fields. The overall dissipation of acrolein in the irrigation canals and fields is caused by reactions with water, aquatic vegetation, suspended matter, soil and microbial metabolism. The results of the aquatic and soil metabolism studies illustrate that acrolein is ultimately metabolized to carbon dioxide and oxalic acid. Acrolein's high reactivity, when combined with the well documented modes of degradation, clearly shows that the product cannot persist in the environment, either in water or soil, and thus cannot reach groundwater. These studies support the experiences of over 40 years of field usage in hundreds of irrigation districts throughout western North America and internationally, wherein there has never been an instance noted of active acrolein residual from an aquatic herbicide application contaminating groundwater.



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## Selected Crop Tolerance Studies

CROP TESTED	CONCENTRATION (ppm)	METHOD OF IRRIGATION	RESULTS
Cotton	80	Flood	No damage; normal harvest.
Cotton	160	Flood	Some damage, below average harvest.
Cotton	240	Flood	Severe damage; below average harvest.
Corn	30, 60, 120	Furrow	No injury.
Potatoes	30, 60, 120	Furrow	No injury at 30, 60; slight at 120.
Beans	30, 60, 120	Furrow	No injury at 30, 60; slight at 120.
Cabbage	30, 60, 120	Furrow	No injury at 30, 60; slight at 120.
Melons	30, 60, 120	Furrow	Slight burn to foliage at 30 when in furrow; serious at 60, 120.
Onions	30, 60, 120	Furrow	No injury at 30, slight bleaching at 60, 120.
Table Beets	30, 60, 120	Furrow	No injury at 30; moderate at 60, 120.
Tomatoes	30, 40, 50, 60, 120	Furrow	No injury at 30, slight at 40, 50; moderate at 60, 120.
Cotton	30, 40, 50, 60, 120	Furrow	No injury at 30, 40, 50; scattered leaf injury at 60, 120.
Peach	10, 20, 30, 60, 90, 120	Flood	No injury to trunk or foliage.
Walnut	10, 20, 30, 60, 90, 120	Flood	No injury to trunk or foliage.
Grapes	10, 20, 30, 60, 90, 120	Flood	No injury to trunk; slight scattered damage to foliage trailing in solution.
Celery (established)	5 - 7 (striking foliage)	Sprinkler	No injury.
Peas (4 - 6")	10 (striking foliage)	Sprinkler	No injury.
Wheat (6 - 8"), Vetch (2 - 4")	8 (striking foliage)	Sprinkler	No injury.
Sugar Beets (3 mo)	8 (striking foliage)	Sprinkler	No injury.
Mustard, Radish (seedlings)	8 (striking foliage)	Sprinkler	No injury.
Wheat	30	Flood	No injury to leaves or roots.
Vetch	30	Flood	Slight scattered burn to leaflets.
Field Corn & Sorghum	55	Furrow	No damage to either.
Pinto Beans (small & large fruit)	55	Furrow	No damage to either.
Hay (Alfalfa & Red Clover)	55	Furrow	No damage to clover; slight bleaching & dropping of alfalfa leaves.
Potatoes (near harvest)	55	Furrow	No damage.
Sugar Beets	55	Furrow	No damage.
Corn, Sugar Beets	60	Furrow	No damage or reduction in yields.
Beans	120	Furrow	No damage or reduction in yields.
(midseason)	180	Furrow	No damage or reduction in yields to corn & beets; slight to beans.
Leaf lettuce	75	Sprinkler	No damage from repeated doses.