LAWS AND REGULATIONS OF AQUATIC HERBICIDE APPLICATIONS

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OVERVIEW





LAWS AND REGULATIONS INTER OVERVIEW

INTERPRETING AQUATIC HERBICIDE LABELS TRANSLATION TO PRACTICE CALIFOR



WHEN DO I NEED TO USE AN AQUATIC HERBICIDE?



- "Aquatic habitat" means bodies of water, such as lakes, reservoirs, rivers, perennial and intermittent streams, wetlands, or ponds, sloughs, and estuaries.*
- In situations where there is direct surface water runoff from treatment sites to aquatic habitat, apply only those chemicals formulated for aquatic or wetland use.**

*Source: California Code of Regulations (Title 3. Food and Agriculture) Division 6. Pesticides and Pest Control Operations **Source: California Pesticide Management Plan for Water Quality - An Implementation Plan for the Management Agency Agreement between The Department of Pesticide Regulation and The State Water Resources Control Board



SURFACE WATER APPLICATIONS

- If: Application may result in discharges to waters of the United States
- Then: National Pollutant Discharge Elimination System (NPDES) – General Permit.

UPDATED DEFINITION "WATERS OF THE U.S."

Source: shutterstock.com

NEW "WATERS OF THE U.S." DEFINITION – JUNE 2020 STILL INCLUDES

- Territorial seas and traditional navigable waters
- Perennial and intermittent tributaries that contribute surface water flow to such waters
- Certain lakes, ponds, and impoundments of jurisdictional waters
- Wetlands adjacent to other jurisdictional waters



NEW "WATERS OF THE U.S." DEFINITION – JUNE 2020 DOES NOT INCLUDE

- Some ditches
- Prior converted cropland
- Areas dependent on artificial irrigation
- Some artificial lakes and ponds
- Most stormwater control features

For more information, refer to:

Federal Register / Vol. 85, No. 77 / Tuesday, April 21, 2020 / Rules and Regulations



SURFACE WATER APPLICATIONS



require surface water sampling!





FISH and WILDLIFE RareFind

Query	Results				Export/Import	Help
Clear Que	ery Criteria	Run Query				
Query Summary: All CNDDB element occurrences						
Species	Name or Co	de				
H Taxonor	nic Group					
H STATUS	i					
H OTHER						

LISTED SPECIES, BULLETINS AND INJUNCTIONS

Endangered Species Litigation and Associated Pesticide Limitations:

- 54 pesticide active ingredients to 26 species of listed salmon and steelhead.
- 66 pesticide active ingredients to the California red-legged frog.
- 59 pesticide active ingredients to 11 species in the greater San Francisco Bay area.

*More info @ www.epa.gov/endangered-species





LAWS AND REGULATIONS INTERPRETING AQUATIC TRANSLATION TO PRACTICE HERBICIDE LABELS

CALIFOR

WHAT TO LOOK FOR:



Applications may only be made for the control of undesirable emergent and floating aquatic vegetation in and around standing and flowing water, including estuarine and marine sites. Applications may be made to control undesirable wetland, riparian and terrestrial vegetation growing in or around surface water when applications may result in inadvertent applications to surface water.

Active ingredient:

Inart ingradiants	uness w 10 se to house on the grant -		71.2%
Total			100.0%
* Equivalent to 22.6% 2-(4,5-c	Rtycko-4-methyl-4-(1-methyle@ydj-5-oxo-1	H-Imidazol-2-yll-3-pyridinecarboxyl	ic acid or 2 pound
acid per galon.			

KEEP OUT OF REACH OF CHILDREN. CAUTION/PRECAUCIÓN

a.k.a. "Product Information"

GENERAL INFORMATION

Use Sites: HABITAT is an aqueous solution to be mixed with water and a surfactant and applied as a spray solution to control floating and emergent undesirable vegetation (see AQUATIC WEEDS CONTROLLED section and the ADDITIONAL WEEDS CONTROLLED BY HABITAT section) in or near bodies of water which may be flowing, non-flowing, or transient. HABITAT may be applied to aquatic sites that include lakes, rivers, streams, ponds, seeps, drainage ditches, canals, reservoirs, swamps, bogs, marshes, estuaries, bays, brackish water, transitional areas between terrestrial and aquatic sites and seasonal wet areas. See AQUATIC USE section of this label for precautions, restrictions, and instructions on aquatic uses.

Read and observe the following directions if aquatic sites are present in terrestrial noncrop areas and are part of the intended treatment area:

Herbicidal Activity: HABITAT will control most annual and perennial grasses and broadleaf weeds in addition to many brush and vine species with some residual control of undesirable species that germinate above the waterline. HABITAT is readily absorbed through emergent leaves and stems and is translocated rapidly throughout the plant, with accumulation in the meristematic regions. Treated plants stop growing soon after spray application. Chlorosis appears first in the newest leaves, and necrosis spreads from this point. In perennials, the herbicide is translocated into, and kills, underground or submerged storage organs, which

WHAT TO LOOK FOR:



Welcome to California Product/Label Database Application

California Product/Label Database Application

Back to DPR Databases

DPR's Product/Label Database contains information concerning all pesticide products registered in California. It inc names, site/pest category uses, pesticidal type, formulation code, registration status, dates, and other types of infor

Instructions on using the database

Product-specific inquiries

Note: Information in these databases and lists are updated at midnight, each business day. Look up pesticide products by:

- Product name
- Registration number
- Single chemical code
- Single site code
- Multiple variables

Site Information

STAT CODE	SITE CODE	SITE NAME	QUALIFIER CODE	SPUSE CODE	SPEC USE DESC	SPUSE NO
A	33015	BAHIAGRASS	0	AO	REGULAR	
A	33017	BERMUDAGRASS	0	AO	REGULAR	
A	6 <mark>5034</mark>	INDUSTRIAL, COMMERCIAL PO	0	AO	REGULAR	
А	65021	IRRIGATION SYSTEMS (DITCH	0	A0	REGULAR	
А	65031	LAKES, PONDS, RESERVOIRS,	0	A0	REGULAR	
А	28 <mark>035</mark>	PASTURES (ALL OR UNSPEC)	0	AO	REGULAR	
A	46027	STORAGE AREAS - FULL (ALL	0	AO	REGULAR	
A	65032	ST <mark>REA</mark> MS, RIVERS, WATERWAY	0	AO	REGULAR	
A	67006	UTIL <mark>I</mark> TY RIGHTS-OF- WAY, YA	0	AO	REGULAR	
A	29603	WILDLIFE	0	AO	REGULAR	
	STAT CODE A A A A A A A A A A	STAT SITE CODE CODE A 33015 A 33017 A 65034 A 65021 A 65031 A 28035 A 46027 A 65032 A 67006 A 29603	STAT CODESITE CODEA33015BAHIAGRASSA33017BERMUDAGRASSA33017BERMUDAGRASSA65034INDUSTRIAL, COMMERCIAL POA65021IRRIGATION SYSTEMS (DITCHA65031LAKES, PONDS, RESERVOIRS,A28035PASTURES (ALL OR UNSPEC)A46027FULL (ALLA65032STORAGE AREAS - FULL (ALLA67006UTILITY RIGHTS-OF- WAY, YAA29603WILDLIFE	STAT CODESITE CODE $OUALIFIERCODEA33015BAHIAGRASS0A33017BERMUDAGRASS0A33017BERMUDAGRASS0A65034INDUSTRIAL,COMMERCIAL PO0A65021IRRIGATION SYSTEMS(DITCH0A65031LAKES, PONDS,RESERVOIRS,0A28035PASTURES (ALL ORUNSPEC)0A65032STORAGE AREAS -FULL (ALL0A65032STREAMS, RIVERS,WATERWAY0A67006UTILITY RIGHTS-OF-WAY, YA0A29603WILDLIFE0$	STAT CODESITE CODESITE NAMEQUALIFIER CODESPUSE CODEA33015BAHIAGRASS0A0A33017BERMUDAGRASS0A0A33017BERMUDAGRASS0A0A65034INDUSTRIAL, COMMERCIAL PO (DITCH0A0A65021IRRIGATION SYSTEMS (DITCH0A0A65031LAKES, PONDS, RESERVOIRS,0A0A28035PASTURES (ALL OR UNSPEC)0A0A65032STORAGE AREAS - FULL (ALL0A0A65032STREAMS, RIVERS, WATERWAY0A0A67006UTILITY RIGHTS-OF- WAY, YA0A0A29603WILDLIFE0A0	STATSITE CODESITE NAMEQUALIFIER CODESPUSESPEC USE CODEA33015BAHIAGRASS0A0REGULARA33017BERMUDAGRASS0A0REGULARA65034INDUSTRIAL, COMMERCIAL PO (DITCH0A0REGULARA65021IRRIGATION SYSTEMS (DITCH0A0REGULARA65031LAKES, PONDS, RESERVOIRS,0A0REGULARA28035PASTURES (ALL OR UNSPEC)0A0REGULARA65032STORAGE AREAS- FULL (ALL0A0REGULARA65032STREAMS, RIVERS, WATERWAY0A0REGULARA67006UTILITY RIGHTS-OF- WAY, YA0A0REGULARA29603WILDLIFE0A0REGULAR

Information on the Site the Product is registered to be used on.













LAWS AND REGULATIONS **OVERVIEW**

INTERPRETING AQUATIC HERBICIDE LABELS



ENVIRONMENTAL PROTECTION AGENCY TOXICITY CATEGORIES

Toxicity Category	Aquatic Organisms: Acute (mg/L)		
practically nontoxic	>100		
slightly toxic	<mark>>10 - 100</mark>		
moderately toxic	>1 - 10		
highly toxic	0.1 - 1		
very highly toxic	< 0.1		

TOXICITY CATEGORY BY HERBICIDE (AND ADJUVANT)



Active Ingredient	Toxicity	y Category	NPDES Maximum	
	Fish* (ppm)	Inverts* (ppm)	Limitation	
imazamox (Clearcast)	>100	>100	none	
triclopyr triethylamine (Garlon 3A)	>100	>100	13.0 ppm ^a	
imazapyr (Habitat, Polaris)	>100	>100	11.2 ppm ^a	
fluridone (Sonar)	>1 - 10	>1 - 10	0.56 ppm	
flumioxazin (Clipper, Propeller)	>1 - 10	>1 - 10	none	
carfentrazone (Stingray) ^b	>1 - 10		none	
glyphosate (Roundup Custom, Rodeo)	>1 - 10	0.1 - 1	0.70 ppm	
endothall (Aquathol K)	0.1 - 1	0.1 - 1	0.10 ppm	
diquat (Reward)	>1 - 10	<0.1	0.02 ppm	
2,4-D ^c	<0.1	<0.1	0.07 ppm	
acrolein (Magnacide) ^c	<0.1	<0.1	0.021 ppm	
copper (Harpoon)	<0.1	<0.1	0.015 - 0.020 ppm	
nonylphenol (R-11, Activator 90, No Foam A)	< 0.1	<0.1	0.0066 ppm	

*Source: USEPA ECOTOX Database (https://cfpub.epa.gov/ecotox/) – CA and relevant model species represented











PRINCIPAL FUNCTIONING AGENTS

Alkylphenol ethoxylate, butyl alcohol,	% BY WT.
Dimethylpolysiloxane	
CONSTITUENTS INEFFECTIVE AS SPRAY ADJUVANTS	<u>10%</u>
Total	100%

Surfactant Content.....80%

WA Reg. No. 2935-50142

KEEP OUT OF REACH OF CHILDREN



IS IT A NONYLPHENOL ADJUVANT?

CHECK THE LABEL FOR "ALKYLPHENOL ETHOXYLATE"



*PRINCIPAL FUNCTIONING AGENTS:

Heavy range paraffinic oil, Polyol fatty acid esters, and	
Polyethoxylated derivatives thereof	
CONSTITUENTS INEFFECTIVE AS SPRAY ADJUVANTS	<u>1.0%</u>
TOTAL	

Surfactant Content:	17.0%
Unsulfonated Oil Residue (UR) Value	95.0% minimum

*All ingredients are accepted for use under CFR 40, 180. CONTAINS PETROLEUM DISTILLATES

KEEP OUT OF REACH OF CHILDREN WARNING May be harmful if swallowed

May be harmful in contact with skin Harmful if inhaled Causes mild skin irritation s eye irritation 5905-50094-AA



COMPETITOR® MODIFIED VEGETABLE OIL

WILBUR-ELLIS

Interest to Grow Will

UENTS INEFFECTIVE AS SPRAY ADJ	100.09
CA Reg. No. 2935-50173	WA Reg. No. 2935-04001

NONYLPHENOL ADJUVANT ALTERNATIVES

UC IPM WEED CONTROL HANDBOOK

Table 1. Summary of Herbicides Available to Control Perennial Pepperweed in Rangeland, Pasture, Rights-of-Way, and Crop Situations. (Most products are NOT for use in home gardens and residential landscapes.)

Herbicide (trade name)	Site	Rate*	Efficacy	Comments
chlorsulfuron (Telar)	rangeland, pasture, noncrop areas	0.75-1.5 oz a.i.	Most effective herbicide; provides 1-3 years of over 90% control.	Has soil residual activity. Selectively controls many broadleaf plants. Do not apply near sensitive crops or water. Add a nonionic surfactant.
2, 4-D ester or amine (several names)	rangeland, pasture, noncrop areas, ditches	1-2 lb a.e.	Yearly applications required for 2 or more years to control established stands. Provides between 50-70% control one year after treatment.	Inexpensive. Selectively controls broadleaf plants. Multiple applications necessary because plants often resprout after treatment. Do not apply near sensitive broadleaf plants. Add a nonionic surfactant.
glyphosate (Roundup, Rodeo, Aquamaster, and others)	rangeland, pasture, crops, ditches, aquatic sites, wetlands, riparian areas, noncrop areas	2-3 lb a.e./a.i.	Variable results. Provides between 40-85% control one year after treatment. Repeat applications needed to control established stands.	Nonselective. If thatch is dense, mow and apply to resprouting plants. Good treatment if reseeding after application. Add a nonionic surfactant.
imazamox (Raptor)	alfalfa, "Clearfield" crops (see label)	0.046 lb a.i.	Provides good season-long suppression. One application per year needed to control established plants.	Has soil residual activity. Apply to spring rosettes in crops. Controls several broadleaf and annual grass species. Add methylated seed oil and nitrogen fertilizer.
imazapyr (Stalker, Arsenal, Habitat)	noncrop areas, fence rows, highway rights-of-way, specified aquatic sites	consult label	Provides between 85-95% control one year after treatment.	Has soil residual activity. Nonselective at rates applied. Controls most grasses and some broadleaf plants. Do not use in rangeland or pasture.
imazethapyr (Pursuit)	alfalfa, edible legumes (see label)	0.093 lb a.i.	Provides season-long suppression in alfalfa. Repeat applications needed to control established plants.	Has soil residual activity. Apply to fall or spring rosettes in crops. Add methylated seed oil and nitrogen fertilizer for postemergence control.

* a.i. = active ingredient; a.e. = acid equivalent

WARNING ON THE USE OF PESTICIDES



HERBICIDE COMPARISON

Parrotfeather (Myriophyllum aquaticum)

Treatment Herbicide Rate ha ⁻¹		Percent Control 6 WAT1	Percent Cover 1 YAT	
Non-treated reference ³		0.0 a	72 a	
2.4-D + Carfentrazone $2.100 g ae + 224 g ai$		23.4 b	61 ab	
Imazapyr + Carfentrazone	1,680 g ac + 224 g ai	67.4 c	49 b	
Imazapyr	1,680 g ae	68.9 c	25 с	
Model fit and random effects			No. 1	
Conditional R ²		0.73	0.61	
Proportion of variance due to rando	om effects	0.26	0.36	
ICCBlock		0.35	0.14	
ICC _{Site}		0.08	0.40	

*Kuehne et al. 2018

HERBICIDE COMPARISON

Waterhyacinth (*Eichhornia crassipes*)



*Madsen and Keyser 2020



*Whitecraft and Grewell 2012

RECAP!

- 1. Must use aquatic herbicides at aquatic sites
- 2. Consider NPDES and listed species restrictions
- 3. Opt for herbicides that safe AND effective



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