

Product Name: FINALE® HERBICIDE
Product Code: 15489
MSDS Number : C3298
Version Date: February 20, 2001

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Material Safety Data Sheet

----- 1. CHEMICAL PRODUCT and COMPANY IDENTIFICATION -----

Product Name: FINALE® HERBICIDE

Product Code: 15489

MSDS Number : C3298

Chemical Name: active ingredient glufosinate ammonium:
butanoic acid, 2-amino-4-(hydroxymethylphosphinyl)-,
monoammonium salt

EPA Registry Number: 432-1229

AVENTIS CROP SCIENCE USA LP
2 T.W. ALEXANDER DRIVE
RESEARCH TRIANGLE PK, NC 27709
UNITED STATES

Finale is a registered trademark of Aventis.

PRODUCT USE:

END-USE PRODUCT DESCRIPTION: Finale Herbicide is for
nonselective weed control of emerged weeds in noncrop
areas.

----- 2. COMPOSITION / INFORMATION on INGREDIENTS -----


Component	Cas number	%
Glufosinate-ammonium	77182-82-2	11.33%
Other ingredients, including:		88.67%
Alkyl hydroxy-poly(oxyethylene) sulfate-salts	9004-82-4	

----- 3. HAZARDS IDENTIFICATION -----

EMERGENCY OVERVIEW:

A blue to bluish-green liquid with a weakly pungent odor.

- Causes substantial but temporary eye injury.
- Harmful if swallowed.

 For Product Use Information: (888) Aventis 24 Hours/Day
Medic./Trans. Emergency:
(DART) (800) 334-7577 24 Hours/Day
(CHEMTREC) (800) 424-9300 24 Hours/Day

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----- 3. HAZARDS IDENTIFICATION (Continued) -----

POTENTIAL HEALTH EFFECTS

SIGNS AND SYMPTOMS OF EXPOSURE:

Gastrointestinal disturbance, tremors, convulsions, respiratory depression, cardiac arrhythmia, decreased blood pressure, drowsiness and/or loss of consciousness. These symptoms may be delayed by up to 48 hours after exposure.

IMMEDIATE EFFECTS

SKIN:

Harmful if absorbed through skin.

EYES:

Causes substantial but temporary eye injury.

INHALATION:

Harmful if inhaled.

INGESTION:

Harmful if swallowed.

----- 4. FIRST AID MEASURES -----

After contact with skin:

Remove contaminated clothing. Wash skin immediately with plenty of soap and water. Get medical attention.

After contact with eyes:


Flush with plenty of water. Get medical attention if irritation persists.

After inhalation:

Remove individual to fresh air. Get medical attention if breathing difficulty develops.

After ingestion:

Rinse mouth thoroughly with plenty of water. Do NOT induce vomiting. Get medical attention immediately.

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4. FIRST AID MEASURES (Continued)

Hints for the physician:

Symptoms may be delayed by up to 48 hours following ingestion. Thus, a patient ingesting undiluted product should be admitted to a hospital for at least 24 hours and treated as outlined below. Treatment should be symptomatic and supportive. In addition, the following procedures are generally recommended:

If ingested, endotracheal intubation and gastric lavage should be performed as soon as possible, followed by charcoal and sodium sulfate administration. Respiratory, Cardiac and Central Nervous Systems should be monitored with particular regard to ECG, electrolyte balance (especially for potassium) and signs of increased intracranial pressure. In the event of a large exposure, dialysis and/or hemoperfusion should be conducted as soon as possible to eliminate the compound from the body. In the event of convulsions, administer phenobarbital or diazepam. There is no specific antidote. Glufosinate-ammonium does not inhibit cholinesterase; thus atropine and 2-PAM are contraindicated. Recovery is normally spontaneous, usually within 48 hours.

5. FIRE FIGHTING MEASURES

FLAMMABLE PROPERTIES

Flash point: 203°F 95°C Closed cup

Advice on protection against fire and explosion:

FIRE FIGHTING INSTRUCTIONS: As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH approved (or equivalent) and full protective gear. Keep upwind. Isolate hazard area. Avoid inhalation of smoke and fumes. Use water or foam to reduce fumes. Do not touch spilled material. If possible, move containers from area. Extinguish only if flow can be stopped. Use flooding amounts of water as a fog. Cool containers with flooding amounts of water from as far a distance as possible. Avoid breathing vapors.

FLAMMABILITY CLASSIFICATION/RATING:

NFPA/OSHA Class: IIIIB

NFPA Rating (Fire): 1



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----- 5. FIRE FIGHTING MEASURES (Continued) -----

Suitable extinguishing media:

SMALL FIRE: Dry chemical or CO2
LARGE FIRE: Foam or water - move containers from fire area
if without risk. Cool containers with water from maximum
distance.

----- 6. ACCIDENTAL RELEASE MEASURES -----

GENERAL AND DISPOSAL: Use proper protective equipment to minimize personal exposure (see Section 8). Take all necessary action to prevent and to remedy the adverse effect of the spill. Ensure that the disposal is in compliance with all Federal, State/Provincial, and local regulations (See Section 13 for applicable RCRA Number). Refer to Section 15 for applicable Reportable Quantity (RQ) and other regulatory requirements.

LAND SPILL OR LEAK

Small Spills: Absorb with an inert absorbent material such as granular clay, saw dust, or pet litter. Sweep up carefully while avoiding the formation of a dust cloud. Place in an approved chemical waste container for disposal. Rinse spill area with small amount of soapy water. Contain and absorb the rinsate with inert absorbents and place into the same disposal container. Area can be washed with water to remove the last trace residue. Do not allow water to contaminate water supplies or sewers.

Large Spills: Eliminate all ignition sources. Stop leak if you can do so without coming into contact with spilled material. Dike far ahead of liquid spill for later disposal. All equipment used to clean up spill should be grounded. Prevent entry into waterways, sewers, basements or confined areas. Inform appropriate authorities immediately if contamination occurs. Contact Aventis for further assistance if necessary.

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----- 7. HANDLING and STORAGE -----

Handling:

- Avoid contact with skin, eyes or clothing.
- Avoid breathing vapor or spray mist.
- Do not use near heat or open flame.

Storage:

- Do not contaminate water, food or feed by storage or disposal.
- Do not store near heat or open flame.
- Store this product in its original container.
- Store product in a secure storage area.

----- 8. EXPOSURE CONTROLS / PERSONAL PROTECTION -----

Hygiene measures:

- Wash hands before eating, drinking, chewing gum, using tobacco, or using the toilet.
- Remove clothing immediately if pesticide gets inside. Then wash thoroughly and put on clean clothing.
- Remove PPE immediately after handling this product. Wash the outside of gloves before removing. As soon as possible, wash thoroughly and change into clean clothing.

Personal protective equipment

MANUFACTURING, FORMULATION AND OTHER NON-AGRICULTURAL USES

ENGINEERING CONTROLS

Control airborne concentrations below the appropriate exposure guideline (see below for any applicable OSHA/ACGIH Exposure Limits). Local exhaust ventilation may be necessary.

EYE/FACE PROTECTION

Wear safety glasses, splash goggles or face shield.

SKIN PROTECTION

Wear chemical-resistant gloves (Neoprene, Nitrile, PVC) and other protective clothing to avoid skin contact.

RESPIRATORY PROTECTION

Ensure good ventilation. If not adequate, use a chemical



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Personal protective equipment (Continued)

cartridge-type respirator approved by the National Institute of Occupational Health and Safety.

GENERAL PROTECTION

Eye wash facility and safety shower should be available.

AGRICULTURAL USES:

The following personal protective equipment (PPE) must be worn when using product or upon early entry into treated areas during the Restricted Entry Interval (REI):

- Long sleeved shirt and long pants; or Coveralls (required for REI only)
- Chemical-resistant gloves
- Shoes and socks
- Protective eyewear
- Chemical-resistant apron during mixing and loading

See "User Safety Recommendations" on the product label for additional details concerning the use of PPE under the EPA Worker Protection Standards (40 CFR Part 170).

EXPOSURE GUIDELINES:

Glufosinate-ammonium (77182-82-2)
Manufacturer's Recommended Limit (8 hr TWA): 0.6 mg/m³

----- 9. PHYSICAL and CHEMICAL PROPERTIES -----

APPEARANCE: Blue to bluish-green liquid.

ODOR: Weakly pungent odor.

BASIC PHYSICAL PROPERTIES

PHYSICAL STATE: Liquid

PH: 6.5 ± 1

VAPOR PRESSURE: Not available

VAPOR DENSITY (AIR=1): Not available

EVAPORATION RATE (BUTYL ACETATE = 1): Not available

SPECIFIC GRAVITY OR DENSITY: 1.06 g/cm³ (±0.05) @ 20°C (68°F)

PACKING (BULK) DENSITY: 8.82 lb/gal @ 20°C

BOILING POINT/RANGE: Not available

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----- 9. PHYSICAL and CHEMICAL PROPERTIES (Continued) -----

MELTING/FREEZING POINT RANGE: Not available
SOLUBILITY (IN WATER): Soluble
SOLUBILITY IN SOLVENTS/OIL (SPECIFIED): Not available
DUST EXPLOSION SEVERITY DATA: Not applicable
MINIMUM IGNITION ENERGY (MJ): Not available
MINIMUM EXPLOSION CONCENTRATION (MEC): Not available
LIMITED OXYGEN CONCENTRATION (LOC): Not available

----- 10. STABILITY and REACTIVITY -----

CHEMICAL STABILITY:

Stable at ambient temperature

CONDITIONS TO AVOID:

None known.

INCOMPATIBILITY:

None known.

HAZARDOUS DECOMPOSITION PRODUCTS:

None known.

HAZARDOUS POLYMERIZATION:


Will not occur.

----- 11. TOXICOLOGICAL INFORMATION -----

THE FOLLOWING DATA WERE DEVELOPED WITH: Finale Herbicide

ACUTE TOXICITY

ORAL LD50 (rat): 3,570 mg/kg (slightly toxic)
DERMAL LD50 (rat): > 2,000 mg/kg (no more than slightly toxic)
INHALATION LC50 (rat, 4hr): 4.42 mg/l (practically non-toxic)
EYE IRRITATION (rabbit): moderately irritating
(Max Avg Score = 22.3/110)
SKIN IRRITATION (rabbit): slightly irritating
(Primary Irritation Index = 0.7/8.0)
SKIN SENSITIZATION (guinea pig): non-sensitizing

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Print date -- November 16th, 2000 10:33 a.m. (E) PS PSA PSFHV -- 1.8 (8/13)

----- 11. TOXICOLOGICAL INFORMATION (Continued) -----

NOTE: The severity classifications listed above are those of Aventis, and, particularly for eye irritation, may not always coincide with EPA-mandated Precautionary Statements.

THE FOLLOWING DATA WERE DEVELOPED WITH:
glufosinate-ammonium, the active ingredient

CHRONIC TOXICITY AND CARCINOGENICITY

No clear evidence of target organ toxicity was noted in studies with rats, mice or dogs. An adaptive increase in kidney weight was noted in several species but no functional or histopathological changes were observed.

No-Observable-Effect-Levels (NOEL's) for the 1-year dog, 2.5-year rat and 2-year mouse studies were approximately 5 mg/kg/day, 2.1 mg/kg/day and 14 mg/kg/day, respectively. Glufosinate-ammonium was not carcinogenic in either rats or mice.

REPRODUCTIVE AND DEVELOPMENTAL TOXICITY

No evidence of teratogenicity was noted in either rats or rabbits. Evidence of developmental toxicity was noted in rats but only at dose levels that were also toxic to the mother. No developmental toxicity was noted in rabbits. The maternal and developmental NOEL's were considered to be 10 and 50 mg/kg/day, respectively, in rats; and 6.3 and 20 mg/kg/day (highest dose tested), respectively, in rabbits. The parental and reproductive NOEL's in a 2-generation rat reproduction study were considered to be 400 ppm (approximately 4 mg/kg/day) and 120 ppm (approximately 12 mg/kg/day), respectively, based on decreased kidney weights at 120 ppm and decreased litter size at 360 ppm.

NEUROTOXICITY

Glufosinate-ammonium does not inhibit acetylcholinesterase activities. No evidence of delayed neurotoxicity was noted in hens. Neurobehavioral effects (e.g., hypersensitivity, tremors, convulsions) related to stimulation of the central nervous system (CNS) were observed in some studies but only at lethal or near lethal dose levels.

MUTAGENICITY (GENETIC EFFECTS)

No evidence of mutagenicity or other genetic effects was noted in a battery of in vitro or in vivo studies.

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----- 12. ECOLOGICAL INFORMATION -----

ENVIRONMENTAL PRECAUTIONS: Do not apply directly to water, to areas where surface water is present or to intertidal areas below the mean high water mark. Do not clean equipment or dispose of equipment washwaters in a manner that will contaminate water resources or arable land. Glufosinate-ammonium and its degradates have those properties normally associated with pesticides that have been detected in groundwater. Use of this product in areas with coarse soils and high water tables may result in groundwater contamination.

ECOLOGICAL TOXICITY

Finale Herbicide is no more than slightly toxic to freshwater fish and aquatic invertebrates. Based on studies conducted with other formulations of glufosinate-ammonium, it is expected to be relatively non-toxic to birds, bees, earthworms and beneficial insects, but may be moderately toxic to some marine and/or estuarine organisms.

THE FOLLOWING DATA WERE DEVELOPED WITH: Finale Herbicide

Bluegill sunfish (96-hr LC50): 79 mg/l
Rainbow trout (96-hr LC50): 42 mg/l
Carp (96-hr LC50): 80 mg/l
Daphnia magna (48-hr EC50): > 100 mg/l

THE FOLLOWING DATA WERE DEVELOPED WITH: glufosinate-ammonium technical


Aquatic

Acute Freshwater Fish & Invertebrates (LC50 or EC50): 560 to > 1000 mg/l
Acute Marine & Estuarine Organisms (LC50 or EC50): 7.2 to > 125 mg/l
Chronic Freshwater Invertebrate (NOEC): 32 mg/l
Aquatic Plants (EC50 or IC50): 1 to > 1000 mg/l

Avian

Acute Oral LD50: > 2,000 mg/kg
Acute Dietary LC50: > 5,000 ppm
Reproductive NOEL: ≥ 400 ppm

Other

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----- 12. ECOLOGICAL INFORMATION (Continued) -----

Honeybee (contact LD50): > 600 micrograms/bee

ENVIRONMENTAL FATE

Glufosinate-ammonium is very soluble in water and under laboratory conditions is hydrolytically and photolytically stable. Its mobility under laboratory conditions varies widely, depending upon the soil type. However, the results of numerous terrestrial field dissipation studies indicate that the potential for groundwater contamination is minimal. This appears to be primarily a result of its rapid degradation by microorganisms in the soil and a tendency to bind to certain soil elements resulting in no measurable leaching. Glufosinate-ammonium does not accumulate in fatty tissues of fish or other animals.

THE FOLLOWING DATA WERE DEVELOPED WITH: glufosinate-ammonium technical


Water Solubility: 1370 g/l (pH 5, 22°C)
Hydrolytic Half-Life: > 300 days
Photolytic Half-Life: > 300 days
Soil Half-Life: 6-23 days in field dissipation studies
Log Pow: < 0.1 (pH 7)
Koc: 10-1229 (depending upon soil type)
Bioconcentration factor (BCF): No accumulation

----- 13. DISPOSAL CONSIDERATIONS -----

Do not contaminate water, food or feed by disposal.

PRODUCT DISPOSAL: Wastes resulting from the use of this product may be disposed of on site or at an approved waste disposal facility.

CONTAINER DISPOSAL: Empty containers should be triple rinsed (or equivalent). Then offer for recycling or reconditioning, or puncture and dispose of in a sanitary landfill, or by incineration, or, if allowed by State and local authorities, by burning. If burned, stay out of smoke.

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----- **13. DISPOSAL CONSIDERATIONS (Continued)** -----

RCRA CLASSIFICATION:

RCRA HAZARDOUS WASTE INGREDIENT: None

----- **14. TRANSPORT INFORMATION** -----

PROPER SHIPPING NAME: None

DOT SHIPPING LABEL: None

NOTE: For transport purposes (49 CFR Part 173.132), the
calculated 1-Hour LC50 (Rat) is: 17.68 mg/l.

----- **15. REGULATORY INFORMATION** -----

STATE REGULATIONS

CALIFORNIA (Proposition 65): This product does not contain
any chemical which is known to the State of California to
cause cancer or birth defects or other reproductive harm.

The following chemicals associated with the product are
subject to the right-to-know regulations in these states:
No components regulated

U.S. FEDERAL REGULATIONS

EPA Registration Number: 432-1229

CARCINOGENICITY: NTP: No IARC: No OSHA: No

SARA TITLE III SECTION 311/312 - HAZARD CLASSES:

Acute Health Hazard - Yes
Chronic Health Hazard - No
Fire Hazard - No
Sudden Release of Pressure Hazard - No
Reactivity Hazard - No

SARA TITLE III - NOTIFICATIONS AND INFORMATION


Section 302 (EHS) ingredients: None

Section 304 (CERCLA & EHS) ingredients (RQ): None

TSCA inventory status

These components are not listed:

Glufosinate Ammonium 11.33% (77182-82-2)

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U.S. FEDERAL REGULATIONS (Continued)

Other ingredients, including: 88.67%

SARA 313 : No components listed

INTERNATIONAL REGULATIONS

Die folgende(n) Chemikalie(n), die mit dem Produkt verbunden sind, sind auch auf folgenden internationalen Listen aufgeführt:

Glufosinate Ammonium (77182-82-2): EINECS

Alkyl hydroxy-poly(oxyethylene) sulfate-salts (9004-82-4):

CANADIAN DSL

WHMIS INGREDIENT DISCLOSURE LISTED COMPONENTS:

CPC NUMBER: None

WHMIS Classification for Control Product Regulations (CPR):
Registered pesticide under US FIFRA regulations; exempt from
CPR classification.

The MSDS contains all CPR required hazard-related
information.

WHMIS HAZARD RATING: See HMIS rating (Section 16)

----- 16. OTHER INFORMATION -----

HAZARD RATINGS

	HEALTH	FLAMM	REACT	OTHER
NFPA	2	1	0	-
HMIS	2	1	0	F


REVISED SECTIONS:

MSDS Revision Indicators: New EPA Number.

PREPARED BY: Dept. of Regulatory Affairs

PHONE: 800-438-5837

SUPERCEDES MSDS DATED: 11/16/2000

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----- **16. OTHER INFORMATION (Continued)** -----

DISCLAIMER:

This information is provided in good faith but without express or implied warranty. Buyer assumes all responsibility for safety and use not in accordance with label instructions.