SAFETY DATA SHEET
DIRECT AG SOURCE, LLC
CLEANSE 2 EC

1. IDENTIFICATION

Product Name:	**CLEANSE 2 EC**
EPA Registration No.	83222-30
Chemical Name of Active Ingredient:	Clethodim: (E)-2-[1-[[(3-chloro-2-propenyl)oxy]imino]propyl]-5-[2-(ethylthio)propyl]-3-hydroxy-2-cyclohexen-1-one
Company Name:	**Direct Ag Source, LLC** 30473 260th St. Eldora, IA 50627
For Information On This Product, Contact The National Pesticide Information Center:	Phone: 1-800-858-7378 (Monday-Friday 7:30 AM-3:30 PM PST)
For Emergency Medical Treatment Information, Contact The National Poison Control Center, Day Or Night:	Phone: 1-800-222-1222
For Chemical Emergencies, Spill, Leak, Fire, Exposure, or Accident, Call Chemtrec:	Phone: 1-800-424-9300

2. HAZARDS IDENTIFICATIONS

EMERGENCY OVERVIEW: WARNING Causes substantial but temporary eye irritation. Avoid contact with skin. Do not get in eyes, on skin, or on clothing. Harmful if swallowed. Avoid breathing vapors or spray mist. Prolonged or frequently repeated skin contact may cause allergic reactions in some individuals.

PHYSICAL PROPERTIES:
Appearance: Light brown liquid.
Odor: Mild aromatic odor.

PHYSICAL OR CHEMICAL HAZARDS: Combustible. Do not use or store near heat or open flame.

POTENTIAL HEALTH EFFECTS:
Signs and Symptoms of Systemic Effects: Signs of toxicity in test animals exposed to lethal or near-lethal oral doses included lethargy, ataxia, irregular breathing, lacrimation and loose stools. This product contains a solvent mixture. Solvents, when inhaled, can cause nasal and respiratory irritation and central nervous system effects including dizziness, weakness, fatigue, nausea, headache and possibly unconsciousness and even death. Ingestion of solvents can cause gastrointestinal irritation, nausea, vomiting and diarrhea. Aspiration of low viscosity products can cause chemical pneumonitis, which can be fatal. Acute exposure to naphthalene by inhalation, ingestion, and dermal contact has been associated with hemolytic anemia, damage to the kidneys, cataracts, and, in infants, brain damage.

Eye: Based on an evaluation of the ingredients and/or similar products, this product is expected to cause prolonged and/or significant irritation. The degree of injury will depend on the amount and duration of contact and the speed and thoroughness of the first aid treatment. The expected adverse health effects resulting from an exposure may include redness, swelling and pain, which could last for an extended period of time.

Skin: Based on an evaluation of the ingredients and/or similar products, this product is expected to cause moderate skin irritation. The degree of injury will depend on the amount and duration of contact and the speed and thoroughness of the first aid treatment. The expected adverse health effects resulting from an exposure may include redness and swelling.

Based on an evaluation of the ingredients and/or similar products, this product may cause allergic skin reactions. In sensitized individuals even small exposures can trigger allergic reactions. The expected adverse health effects may include itching, redness, swelling and blistering of the skin.

Based on an evaluation of the ingredients and/or similar products, this product is expected to be minimally toxic when absorbed through the skin. The degree of injury will depend on the amount of material inhaled and the speed and thoroughness of the first aid treatment. The expected adverse systemic health effects are described above.

Ingestion: Based on an evaluation of the ingredients and/or similar products, this product is expected to be slightly toxic when ingested. The degree of injury will depend on the amount of material ingested and the speed and thoroughness of the first aid treatment. The expected adverse systemic health effects are described above. Ingestion of this product may cause gastrointestinal irritation, nausea, vomiting and diarrhea. Because of the low viscosity of this substance, it can directly enter the lungs of it is swallowed (this is called aspiration). This can occur during the act of swallowing or when vomiting the substance. Once in the lungs, the substance is very difficult to remove and can cause injury to the lungs and death.

Inhalation: Exposure to high concentrations may result in respiratory irritation. Signs and symptoms may include, but not be limited to, nasal discharge, sore throat, coughing and difficulty in breathing.
Based on an evaluation of the ingredients and/or similar products, this product is expected to be minimally toxic when inhaled. The degree of injury will depend on the amount of material inhaled and the speed and thoroughness of the first aid treatment. The expected adverse systemic health effects are described above.

3. COMPOSITION/INFORMATION ON INGREDIENTS

CHEMICAL NAME	CAS NUMBER	%	ACGIH/TLV	OSHA/PEL	OTHER	NTP/IARC/OSHA (Carcinogen)
Clethodim	99129-21-2	25-27	NE	NE	NE	NA
Total aromatic hydrocarbons	64742-94-5	65-71	100 ppm 525 mg/m^3	NE	NE	NA
Contains Naphthalene (% of total)	91-20-3	5-7	10 ppm 52 mg/m^3 (TWA)	10 ppm 50 mg/m^3 (TWA)	15 PPM (STEL)	NTP – 2* IARC –2B**
Trimethylbenzene	95-63-6	2-3	25 ppm (TWA)	NE	NE	NA

* Substances which may reasonably be anticipated to be carcinogens.
** Substance is possibly carcinogenic to humans.
NE: Not established; NA: Not applicable.

4.FIRST AID MEASURES

FIRST AID	
IF IN EYES:	• Hold eye open and rinse slowly and gently with water for 15-20 minutes. • Remove contact lenses, if present, after the first 5 minutes, then continue rinsing eye. • Call a poison control center or doctor for treatment advice.
IF ON SKIN OR CLOTHING:	• Take off contaminated clothing. • Rinse skin immediately with plenty of water for 15-20 minutes • Call a poison control center or doctor for treatment advice.
IF SWALLOWED:	• Immediately call a poison control center or doctor. • Do not induce vomiting unless told to do so by a poison control center or doctor. • Do not give any liquid to a person. • Do not give anything by mouth to an unconscious person.
Have the product container or label with you when calling a poison control center or doctor, or going for treatment. For information on this product, contact the National Pesticide Information Center, 1-800-858-7378, Monday-Friday, 7:30 AM-3:30 PM PST. You may also contact the National Poison Control Center, 1-800-222-1222, day or night, for emergency medical treatment information.	
NOTE TO PHYSICIANS Ingestion of this product or subsequent vomiting can result in aspiration of light hydrocarbon liquid, which can cause pneumonitis. If ingested, probable mucosal damage may contraindicate the use of gastric lavage.	

5. FIRE FIGHTING MEASURES

FLASH POINT: > 159^{o}F (70.5^{o}C)
AUTOIGNITION TEMPERATURE: Not available

FLAMMABLE LIMITS: Not available

FIRE FIGHTING INSTRUCTIONS: Liquid evaporates and forms vapor (fumes), which can catch fire and burn with explosive violence. Invisible vapor spreads easily and can be set on fire by many sources such as pilot lights, welding equipment, and electrical motors and switches. Fire hazard is greater as liquid temperature rises above 85°F. Products of combustion from fires involving this material may be toxic. Avoid breathing smoke and mists. Avoid personnel and equipment contact with fallout and runoff. Minimize the amount of water used for fire fighting. Do not enter any enclosed area without full protective equipment, including self-contained breathing equipment. Contain and isolate runoff and debris for proper disposal. Decontaminate personal protective equipment and fire fighting equipment before reuse. Read the entire document.

HAZARDOUS COMBUSTION PRODUCTS: Normal combustion forms carbon dioxide, water vapor and may produce oxides of nitrogen, sulfur. Combustion may produce toxic compounds of chlorine. Incomplete combustion can produce carbon monoxide.

6. ACCIDENTAL RELEASE MEASURES

Stop the source of the spill if safe to do so. Contain the spill to prevent further contamination of the soil, surface water, or ground water.

FOR SPILLS ON LAND:

CONTAINMENT: Avoid runoff into storm sewers and ditches which lead to waterways. Contain spilled liquids with dry sorbents.

CLEANUP: Clean up spill immediately. Absorb spill with inert material (such as dry sand or earth), then place in a chemical waste container. Wash the area with soap and water. Pick up wash liquid with additional absorbent and place in a chemical waste container.

FOR SPILLS IN WATER:
CONTAINMENT: This material forms an emulsion in water. Stop or reduce contamination of any water. Isolate contaminated water.

CLEANUP: Remove contaminated water for treatment or disposal.

7. HANDLING AND STORAGE

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

PROHIBITIONS: Do not contaminate water, food, or feed by storage or disposal, or cleaning of equipment. Open dumping is prohibited.

STORAGE: Keep pesticide in original container. Do not put concentrate or dilute into food or drink containers. Store in cool, dry place. Do not store diluted spray.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

END USER MUST READ AND OBSERVE ALL PRECAUTION ON PRODUCT LABEL.

EYE PROTECTION: Protective eyewear.

SKIN PROTECTION: Long-sleeved shirt and long pants. Chemical-resistant gloves such as barrier laminate or viton≥ 14 mils. Shoes plus socks.

RESPIRATORY/VENTILATION: Not normally required. If vapors or mists exceed acceptable levels, wear NIOSH approved air-purifying respirator with cartridges/canisters approved for use against pesticides.

USER SAFETY RECOMMENDATIONS:

Users should:

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

EXPOSURE GUIDELINES: Refer to Section 3.
ENGINEERING CONTROLS: Use adequate ventilation to minimize airborne concentrations of this material.

9. PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE: Light brown liquid
ODOR: Mild aromatic odor
FLASH POINT: 159^{o}F (70.5^{o}C)
pH: 3.94 as 1% dispersion
SPECIFIC DENSITY: 0.95 g/ml@26^{o}C
SOLUBILITY IN WATER: Emulsifies in water
VISCOSITY: 2.77 cps@26^{o}C

10. STABILITY AND REACTIVITY

CHEMICAL STABILITY: Unstable at extreme pHs, temperature and upon exposure to UV light.

CONDITIONS AND INCOMPATIBLE MATERIALS TO AVOID: May react with strong oxidizing agents, such as chlorates, nitrates, peroxides.

HAZARDOUS COMBUSTION PRODUCTS: Normal combustion forms carbon dioxide, water vapor and may produce oxides of nitrogen, sulfur. Combustion may produce toxic compounds of chlorine. Incomplete combustion can produce carbon monoxide.

11. TOXICOLOGICAL INFORMATION

ACUTE TOXICITY/IRRITATION STUDIES:

Acute oral LD50 (Rat): No product specific data available. A hazard assessment based on the ingredients and/or similar products indicates that this product could be slightly toxic when ingested. (Toxicity Category III) Signs of toxicity at lethal or near lethal doses included lethargy, ataxia, irregular breathing, lacrimation and loose stools.

Acute Dermal LD50 (Rat): No product specific data available. A hazard assessment based on the ingredients and/or similar products indicates that this product could cause minimal toxicity when absorbed through the skin. (Toxicity Category IV)

Acute Inhalation LC50: No product specific data available. A hazard assessment based on the ingredients and/or similar products indicates that this product could cause minimal toxicity when inhaled. (Toxicity Category IV) This product is also expected to be a respiratory irritant.

Eye Irritation (rabbit): No product specific data available. Based on an evaluation of the ingredients and/or similar products, this product is expected to cause prolonged and/or significant eye irritation. (Toxicity Category II)

Dermal Irritation (rabbit): No product specific data available. Based on information for the ingredients and/or similar products, this product is expected to produce moderate skin irritation. (Toxicity Category III)

Dermal Sensitization: No product specific data available. Based on a review of the ingredients and/or similar products, this product may be a skin sensitizer.

TOXICITY OF CLETHODIM TECHNICAL:
SUBCHRONIC TOXICITY (CLETHODIM): Compound-related effects at high doses were decreased body weights, increased liver size and anemia

CARCINOGENICITY (CLETHODIM): Similar effects as seen in subchronic. No treatment related increases in neoplasms were observed in any study.

TERATOGENICITY (CLETHODIM): Developmental toxicity in rats and rabbits was observed only at maternally toxic dose levels.

REPRODUCTION (CLETHODIM): No reproductive toxicity was observed in a study with rats exposed for two generations.

MUTAGENICITY (CLETHODIM): Negative in the following genotoxicity assays: microbial reverse mutation (Ames Assay), **in vitro** chromosome aberration assay in Chinese Hamster Ovary Cells, **in vivo** chromosome aberration assay in Rat Bone Marrow Cells and **in vivo** Unscheduled DNA Synthesis Assay. Clethodim does not present a genetic hazard to intact animal systems.

TOXICITY OF OTHER INGREDIENTS: This product contains a solvent mixture. Solvents, when inhaled, can cause nasal and respiratory irritation and central nervous system effects including dizziness, weakness, fatigue, nausea, headache, and possibly unconsciousness and even death. Ingestion of solvents can cause gastrointestinal irritation, nausea, vomiting, and diarrhea. Prolonged or repeated dermal exposures may cause drying, scaling, and even blistering of the skin. Aspiration of low viscosity products can cause chemical, which can be fatal. Reports have associated repeated and prolonged occupational overexposure to solvents with permanent brain and nervous system damage. Symptoms include fatigue, concentration difficulties, anxiety, depression, rapid mood swings and short-term memory loss. The reports are not clear with regard to the types of solvents that may cause these symptoms, and there is controversy among scientists to whether the condition exists or is caused by this type of product. Since many other diseases cause some or all of these conditions, a doctor should be consulted if any appear.
Acute exposure to naphthalene by inhalation, ingestion, and dermal contact has been associated with hemolytic anemia, damage to the kidneys, cataracts, and in infants, brain damage. There is limited evidence of fetal and maternal toxicity from exposure to naphthalene.
Chronic (long-term) exposure of workers and rodents to naphthalene has been reported to cause cataracts and damage to the retina. Lesions in the kidneys and thymus, signs of anemia, and reduced spleen weights have been observed in rats and mice chronically exposed via gavage.

12. ECOLOGICAL INFORMATION

ENVIRONMENTAL HAZARDS: 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 apply where runoff is likely to occur. Do not apply where weather conditions favor drift from areas treated. Do not contaminate water when disposing of equipment washwater or rinsate.

AVIAN TOXICITY: The acute toxicity of Clethodim Technical to birds is very low.

Bobwhite quail oral LD_{50} : > 2 g/kg
Bobwhite quail dietary LC_{50} : > 6,000 ppm
Mallard duck dietary LC_{50} : > 6,000 ppm

No reproductive effects were observed in mallard ducks exposed to 100 ppm of Clethodim Technical. In Bobwhite quail, a slight decrease in viability of embryos of eggs from females exposed to 1000 ppm was observed. A NOEL was established at 300 ppm for this study.

AQUATIC ORGANISM TOXICITY: Clethodim Technical is only slightly toxic to freshwater fish and practically nontoxic to daphnia.

Rainbow Trout 96-hour LC_{50} = 67 mg/l
Bluegill Sunfish 96-hour LC_{50} = 120 mg/l
Daphnia magna 48-hour LC_{50} greater than 120 mg/l

OTHER NON-TARGET ORGANISM TOXICITY: Clethodim Technical was found to be nontoxic to adult worker bees at the highest dose tested, 100 micrograms/bee.

13. DISPOSAL CONSIDERATIONS

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

CONTAINER DISPOSAL: Dispose of product containers, waste containers, and residues according to label instructions and local, state, and federal health and environmental regulations.

14. TRANSPORT INFORMATION

DOT CLASSIFICATION:

Non-bulk: Not regulated

Bulk (>119 gallons): NA1993, Combustible liquid, N.O.S. (Naphthalene), PG III*
* For shipments > 180 gallons, RQ is required in shipping description.

INTERNATIONAL TRANSPORTATION:

IMO (vessel): Not regulated

IATA (air): Not regulated

15. INFORMATION

SARA TITLE III CLASSIFICATION:

Section 302:	Not applicable.
Section 311/312:	Acute health hazard (immediate) Delayed health hazard (chronic) Fire Hazard
Section 313:	Naphthalene CAS# 91-20-3 (5-7%)

CERCLA RQ:

Chemical Name	CAS NO.	RQ (Pound)	% in Product
Naphthalene	91-20-3	100 (Cleanse 2EC = 180 gallons)	5 - 7

RCRA CLASSIFICATION: Under RCRA, it is the responsibility of the product user to determine at the time of disposal, whether a material containing the product or derived from the product should be classified as a hazardous waste.

TSCA STATUS: All ingredients are listed on the TSCA inventory or are not required to be listed on the TSCA inventory.

STATE RIGHT-TO-KNOW: Other state regulations may apply. Check individual state requirements.

CALIFORNIA PRO 65: This product contains a chemical (Naphthalene) that is known to the State of California to cause cancer.

16. OTHER INFORMATION

NFPA HAZARD RATINGS	NFPA		
HEALTH:	2	0	MINIMAL
FLAMMABILITY:	2	1	SLIGHT
REACTIVITY:	0	2	MODERATE
		3	HIGH
		4	SEVERE

MSDS DATE: 12-19-2012. Supercedes version dated 11-08-2010. Changes made to all sections.

The information herein is presented in good faith and believed to be accurate as of the effective date shown above. However, no warranty, express or implied, is given. Regulatory requirements are subject to change and may differ from one location to another; it is the buyer's responsibility to ensure that its activities comply with federal, state, or provincial, and local laws.