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U.S. ENVIRONMENTAL PROTECTION AGENCY
Office of Pesticide Programs
Registration Division (7505C)
401 "M" St., S.W.
Washington, D.C. 20460

EPA Reg. Number:
63963-1

Date of Issuance:

Term of Issuance:
Unconditional

Name of Pesticide Product:
Ethylene

NOTICE OF PESTICIDE:
 Registration
XX Reregistration

(under FIFRA, as amended)

Name and Address of Registrant (include ZIP Code):

Liquid Air Corporation
2121 North California Blvd.
Walnut Creek, CA 94596

BEST AVAILABLE COPY

Note: Changes in labeling differing in substance from that accepted in connection with this registration must be submitted to and accepted by the Registration Division prior to use of the label in commerce. In any correspondence on this product always refer to the above EPA registration number.

On the basis of information furnished by the registrant, the above named pesticide is hereby registered/reregistered under the Federal Insecticide, Fungicide and Rodenticide Act.

Registration is in no way to be construed as an endorsement or recommendation of this product by the Agency. In order to protect health and the environment, the Administrator, on his motion, may at any time suspend or cancel the registration of a pesticide in accordance with the Act. The acceptance of any name in connection with the registration of a product under this Act is not to be construed as giving the registrant a right to exclusive use of the name or to its use if it has been covered by others.

Based on your response to the Reregistration Eligibility Document(s), EPA has reregistered the product listed above. Enclosed is a copy of your label stamped "Accepted." This action is taken under the authority of section 4(g)(2)(c) of the Federal Insecticide, Fungicide, and Rodenticide Act, as amended. Reregistration under this section does not eliminate the need for continual reassessment of pesticides. EPA may require submission of data at any time to maintain the registration of your product.

A stamped copy of your label is enclosed for your records.

Signature of Approving Official:

[Handwritten Signature]

Date:

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At the next printing of the labeling move the heading Environmental Hazards directly above "For terrestrial uses,...". Move the Environmental Hazards section from the Directions For Use section to the Precautionary Statements section of the labeling.

Cynthia Giles-Parker
Product Manager (22)
Fungicide-Herbicide Branch
Registration Division (7595C)

Enclosure

DO NOT DETACH
THIS BOOKLET

Jacket

DANGER

EXTREMELY FLAMMABLE

Keep this cylinder away from heat, flame and
fires and spark producing devices.

STORE IN WELL VENTILATED COOL PLACE

The contents of this cylinder
must be used in accordance with the
directions in this Booklet.

APPROXIMATE PRESSURE WHEN FULL

1200 PSIG AT 70°F

ETHYLENE GAS
Directions for Use

AIR LIQUIDE AMERICA CORP.

2121 North California Blvd.
Walnut Creek, CA 94596

P.O. Box 3047
Houston, TX 77253

DO NOT DETACH THIS BOOKLET

DANGER

EXTREMELY FLAMMABLE

ETHYLENE is extremely flammable when mixed with air and will explode if ignited. Active Ingredient: Ethylene 95% by weight. Flammable in air between 2.7% and 36% by volume.

AGRICULTURAL USE REQUIREMENTS

Use this product only in accordance with its labeling and with the Worker Protection Standard, 40 C.F.R. part 170. This Standard contains requirements for the protection of agricultural workers on farms, forests, nurseries, and greenhouses, and handlers of agricultural pesticides. It contains requirements for training, decontamination, notification, and emergency assistance. It also contains specific instructions and exemptions pertaining to the statements on this label about Personal Protective Equipment (PPE). The requirements in this box only apply to uses of this product that are covered by the Worker Protection Standard.

Do not enter or allow worker entry into treated areas during the restricted entry interval (REI) of 12 hours.

Exception: if the product is soil-injected or soil-incorporated, the Worker Protection Standard, under certain circumstances, allows workers to enter the treated area if there will be no contact with anything that has been treated.

PPE required for early entry to treated areas that is permitted under the Worker Protection Standard and that involves contact with anything that has been treated, such as plants, soil, or water is: coveralls, waterproof gloves, shoes plus socks, and protective eyewear.

PINEAPPLE PLANT 2.5 lb./acre. To induce flowering when plant is mature - apply as pressure spray using 500-800 gallons water/acre vegetative growth. Use of china clay, bentonite or other suitable absorbent in suspension in the water is recommended.

WITCHWEED CONTROL CROPS: Corn, Cotton, Peanuts, Soybeans

APPLICATION DATES: May through July

PRECONDITIONING PERIOD: The witchweed seeds must be exposed to adequate moisture and temperatures above 72°F for a period of at least two weeks prior to application of the ethylene.

APPLICATION: A soil injector is used to apply the ethylene and the gas is delivered from the cylinder through a regulator and a flowmeter. Shanks attached to a tool bar release the gas approximately 6 to 10 inches below the soil surface. The maximum shank spacing will not exceed 40 inches. The rate of application is 1.5 pounds per acre (1.5 pounds per acre equals 19.47 cubic feet). The treatment rate can be calculated using the following formula:

$(\text{Tractor Speed, MPH}) (0.12) (\text{Treatment width, ft.}) (\text{Recommended application rate, cubic ft. per acre}) = \text{flow rate in cubic feet per hour.}$

NOTE: The flow meter is used to measure the flow rate in cubic feet per hour of the gas applied.

The ethylene may be broadcast throughout an infected field or it may be injected between the crop rows.

Witchweed commonly occurs in sandy soil, however, the use of ethylene to control witchweed is not restricted to soil texture. In course sandy soil the ethylene disperses in a 48 inch radius from the point of injection, while a 30 inch radius of dispersal is found in clay soils.

For use by or under the supervision of USDA personnel only. Sequential applications with other herbicides may result in crop injury. Injection between row crops without additional weed control techniques will give no witchweed control in current season.

TECHNICAL REFERENCE "A Witchweed Seed Germination Stimulant" Robert E. Epice, USDA Witchweed Method Development Laboratory, Whiteville, NC.

For use by or under the supervision of Federal and/or State personnel in accordance with the U.S. Department of Agriculture's manual instructions for witchweed eradication or control.

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Non-Agricultural Use Requirements

The requirements in this box apply to uses of this product that are NOT within the scope of the Worker Protection Standard for agricultural pesticides (40 CFR Part 170). The WPS applies when this product is used to produce agricultural plants on farms, forests, nurseries, or greenhouses.

RECOMMENDED DOSAGE: To be used in air in a tightly enclosed treatment room. Do not degreen until time to ready the fruit for market.

Mature Fruit	PPM	Temp	RH	USE	Time of Exposure
BANANA	1000	65-70°F	90%	To initiate degreening and ripening	3-4 Days
CITRUS:	1000		90%	To initiate degreening	2 1/2 - 5 Days
Grapefruit Orange Lemon Tangerine		80-90°F 70°F	80%	Use adequate ventilation before each application	Apply 2x a Day
MELONS: Honeydew	1000	65°F	80%	To initiate degreening	3-4 Days
PEARS: Bartlett Bosc	1000	65°F		To initiate degreening and ripening. Use adequate ventilation before each application.	4-8 Days Apply 2x a Day
PERSIMMON	1000	65°F	80%	To initiate degreening to remove astringency and to soften	2 Days
PINEAPPLE	1000	65°F	40%	To initiate degreening	3-4 Days
TOMATOES	1000	65-75°F	85-95%	To initiate degreening and ripening.	6 Days Observe Daily
WALNUTS	1000	70-80°F	Low	To loosen hulls. Thoroughly ventilate before each application	2 1/2-3 1/2 Days Apply 2x a Day

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GENERAL PRECAUTIONS
DANGER: EXTREMELY FLAMMABLE

1. DO NOT USE OPEN FLAME HEATERS, EXPOSED ELEMENT ELECTRIC HEATERS OR ANY SPARK PRODUCING ELECTRICAL EQUIPMENT SUCH AS ELECTRIC MOTORS WITH EXPOSED BRUSHES. USE FANS WITH AN INDUCTION TYPE OR SEALED-IN MOTOR.
2. Post "DANGER: EXTREMELY FLAMMABLE" and "NO SMOKING" signs inside the sweating room, on the outside of all doors, and in the vicinity of the cylinders and measuring apparatus.
3. Cylinders should be stored in a well-ventilated area. When discharged from a cylinder in a confined space, ethylene gas replaces the air and may be harmful. Do not breathe vapors.
4. Use only metal connections and piping capable of withstanding a working pressure of 2,000 pounds per square inch.
5. CYLINDERS MUST BE SECURED IN AN UPRIGHT POSITION WHEN DISCHARGING, and must be grounded before discharging in order to avoid static sparks.
6. CYLINDER VALVE OUTLET CONNECTION IS CGA 350 (LEFT-HAND THREAD); USE REGULATOR ESPECIALLY MADE FOR ETHYLENE GAS.
7. Comply with all insurance requirements, laws, ordinances and regulations.

DIRECTIONS FOR USE
DANGER: EXTREMELY FLAMMABLE
AMOUNT OF GAS NEEDED

Each application of ethylene should consist of not more than one cubic foot of ethylene to 1,000 cubic feet of room space. Use of an additional quantity of ethylene will not speed up the coloring process. An excess quantity of ethylene may result in an accumulation of a flammable and explosive air-gas mixture which should be avoided.

Before starting the treatment, it is necessary to determine the cubic content of the room by multiplying the length by the width by the height. No allowance is made for the space occupied by the fruit. For instance a room 20 feet long, 15 feet wide, and 10 feet high contains 3,000 cubic feet and requires a maximum of three cubic feet of ethylene, per treatment.

THE PROPER TEMPERATURE

Keep the temperature between 65°F and 90°F depending on the type and condition of the fruit. If the room becomes cooler than 65°F, the coloring process is slow. At temperatures over 80°F, bacterial growth and rotting may be accelerated.

When the room must be heated, a hot water or steam pipe system is the most suitable. NEVER USE AN OPEN FLAME. The heating may be done with a gas or electric heater which has been examined and LISTED FOR THIS APPLICATION by Underwriters' Laboratories, Inc. No other heater should be used in the room.

APPLICATION

Ventilate the room before each application of ethylene, particularly if the room is well sealed. Fruits "breathe" and, like human beings, need plenty of oxygen. The air can be changed by opening the doors and windows for about half an hour before each treatment is made. In specially constructed or large sweating rooms, a ventilating fan should be provided. A fan is also useful for circulating the air and ethylene mixture. **BUT ONLY IN SPECIALLY BUILT AIRTIGHT ROOMS.** It assists the ethylene to penetrate closely packed fruits and reduces the coloring time. In loosely constructed rooms, the fan would quickly drive the ethylene out and should never be used.

All electrical equipment, including lights, fan motors, switches, etc. should comply with National Electric Code for Class 1, Group D equipment and installations. Ethylene is introduced into the room in accurately measured quantities at regular intervals of time. The gas should be conducted from the cylinder through a regulator with a flowmeter calibrated for measuring flow in cubic feet per mixture of ethylene gas. The gas then flows to the treating room through metal pipes or tubing.

THE REGULATOR SHOULD BE OPERATED AS FOLLOWS:

1. Connect the regulator to the cylinder valve. (Note the threads of the valve are left-hand). See that the union nut is drawn up tight to prevent any leak at this point. Soapy water applied to this joint will indicate leaks by expanding bubbles. **NEVER USE A MATCH OR OPEN FLAME TO CHECK FOR FLAMMABLE GAS LEAKS.**
2. Attach a flexible metal hose from the outlet connection of the regulator to the piping which leads to the building or vault containing the fruit. This **LEAD-IN PIPE MUST BE GROUNDED.**
3. See that the handwheel on the regulator is backed up by turning it to the left so that it is loose. Open the valve at the top of the cylinder **SLOWLY** by turning to the left all the way.
4. Assume the sweating room is 20 feet long, 15 feet wide, and 10 feet high, or 3,000 cu. ft. in volume. This would usually require approximately three (3) cu. ft. of ethylene. Time the gas flow by holding a watch in one hand, and turn the pressure adjusting screw clockwise until the needle starts to move. Start the timing from this point, and continue to turn the pressure adjusting screw in, until the pointer shows 1/2 cu. ft. of ethylene is flowing from the cylinder each minute. Allow the ethylene to flow for six minutes (six minutes times 1/2 cu. ft. per minute equals three cu. ft.) and then reverse the handwheel counterclockwise until it is loose. **THEN CLOSE THE CYLINDER VALVE TIGHTLY.**
5. Detach the hose from the regulator so that it becomes impossible for any more ethylene to get into the ripening room.

A low rate of flow, rather than a high rate, is desirable as the longer time required will assure greater accuracy in measuring the gas. The following rates of flow are recommended:

For Rooms up 5,000 cu. ft. in volume: 1/2 cu. ft. per minute
For Rooms up to 5,000 and 10,000 cu. ft.: 1 cu. ft. per minute
For Rooms over 10,000 cu. ft.: 2 to 2 1/2 cu. ft. per minute

THOROUGH VENTILATION IS ESSENTIAL. It is customary to treat the fruits twice each day, usually in the morning and at night. In many cases, better results are obtained from four treatments per day at 6-hour intervals.