

US ENVIRONMENTAL PROTECTION AGENCY
OFFICE OF PESTICIDES PROGRAMS
REGISTRATION DIVISION (TS-767)
WASHINGTON, DC 20460

EPA REGISTRATION NO.
62963-1

DATE OF ISSUANCE
JAN 30 1991

TERM OF ISSUANCE

NOTICE OF PESTICIDE: REGISTRATION
 REREISTRATION
(Under the Federal Insecticide, Fungicide,
and Rodenticide Act, as amended)

NAME OF PESTICIDE PRODUCT
Ethylene

NAME AND ADDRESS OF REGISTRANT (Include ZIP code)

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

NOTE: Changes in labeling formula 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 U.S. 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.

A copy of the labeling accepted in connection with this Registration/Reregistration is returned herewith.

Registration is in no way to be construed as an indorsement or approval of this product by this 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.

This product is conditionally registered in accordance with FIFRA sec. 2(c)(7)(B) provided that you:

1. Submit and/or cite all data required for registration/reregistration of your product under FIFRA sec. 2(c)(5) when the Agency requires all registrants of similar products to submit such data.

2. Add the phrase, "EPA Registration No. 62963-1" and submit five (5) copies of your final printed labeling before you release the product for shipment.

If these conditions are not complied with, the registration will be subject to cancellation in accordance with FIFRA sec. 6(c). Your release for shipment of the product constitutes acceptance of these conditions.

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

Sincerely yours,

Robert J. Taylor
Product Manager (25)
Fungicide-Herbicide Branch
Registration Division (1750-30)

BEST AVAILABLE COPY

ATTACHMENT IS APPLICABLE

SIGNATURE OF APPROVING OFFICIAL

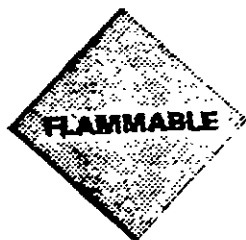
Robert J. Taylor

DATE

1/30/91

ETHYLENE

UN 1962



Active Ingredient - Ethylene	95.0%
Inert Ingredients -	5.0%
Total	100.0%

63963 1

DANGER

Keep out of reach of children

Alphagaz
Div. of Liquid Air Corp.
2121 N. California Blvd.
Walnut Creek, CA 94596
(415) 977-6500

Establishment No. _____
EPA Registration No. _____

Net Contents ____ lbs.

IN CASE OF EMERGENCY CALL 1-800-231-1366

Precautionary Statements

Hazard to Humans and
Domestic Animals

Harmful if inhaled. Avoid breathing vapors.

First Aid:

If inhaled, remove to fresh air. If not breathing, give artificial respiration with supplemental oxygen. If breathing is difficult, give Oxygen. Get medical attention.

If in eyes, flush with plenty of water. Get medical attention.

If on skin, wash with water. Get medical attention.

In case of frostbite, soak in lukewarm (not hot) water. Get medical attention.

Physical or Chemical Hazards

Extremely flammable. Contents under pressure. Keep away from fire, sparks, and heated surfaces. Do not puncture or incinerate container. Exposure to temperatures above 130° F may cause bursting.

Directions for Use
General Classification

Storage and Disposal

Store and use with adequate ventilation. Store in cool well ventilated area. Keep cylinder away from heat, direct sunlight, open flames and spark producing devices. Keep cylinder temperature from exceeding 130° F. Close valve when not in use and when empty. Return cylinder to supplier.

Environmental Hazards

Leak: Evacuate area and move personnel upwind. Stop flow of gas and ventilate area if without risk. Leaking cylinder may be vented outside away from ignition source and people. Contact supplier for instructions.

Fire: If possible, stop flow of gas supply and allow fuel to consume itself. Use water spray or fog nozzle to keep cylinder and surrounding areas cool. Move cylinder away from fire if without risk.



**DO NOT DETACH
THIS BOOKLET**

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**



LIQUID AIR

AN AIR LIQUIDE GROUP COMPANY

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



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.

RECOMMENDED DOSAGE: To be used in air in a tightly enclosed treatment room. Do not degreen until 24 hours 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		80-90°F		Use adequate ventilation before each application	Apply 2x a Day
Orange			80%		
Lemon		70°F			
Tangerines					
MELONS:	1000	65°F	80%	To initiate degreening	3 - 4 Days
Honeydew					
PEARS:	1000	65°F		To initiate degreening and ripening. Use adequate ventilation before each application	4 - 8 Days Apply 2x a Day
Bartlett					
Bosc					
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

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, Peas, 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

WITCHWEED CONTROL

below the soil surface. The maximum plant 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 infested field or it may be injected between the crop rows.

DO NOT TILL THE SOIL WITHIN 8 HOURS AFTER APPLICATION.

Witchweed commonly occurs in sandy soil, however, the use of ethylene to control witchweed is not restricted to soil texture. In coarse 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. Eples, 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.

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.

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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 minute 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. Turn 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 to 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 two treatments per day at 6-hour intervals.

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