



DO NOT DETACH

THIS BOOK-LET

DO NOT DETACH THIS BOOKLET

DANGER

DANGER

EXTREMELY FLAMMABLE

ETHYLENE is Extremely Flammable when Mixed With Air and Will Explode if Ignited. Active Ingredient: Ethylene 100% by Weight Flammable in air between 2.7% to 36% by Volume

EXTREMELY FLAMMABLE

Keep this cylinder away from heat, flame and fires and spark producing devices. STORE IN WELL VENTILATED COOL PLACE.

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

Market fruit	PPM	Temp.	RH	Use	Time of exposure
BANANA	1000	65-70°F	90%	To initiate degreening and ripening	3-4 days
CITRUS:	1000 (1)	80-90°F	90%	To initiate degreening use adequate ventilation before each application	2 1/2 - 5 days
Grapefruit					Apply 2x a day
Orange (1)					
Lemon (2)	(2)	70°F	80%		
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	4-6 days
Bartlett					Apply 2x a day
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

The Contents of this Cylinder must be Used in Accordance with the Directions in This Booklet

APPROXIMATE PRESSURE WHEN FULL
ACCEPTED
 1200 PSIG AT 70°F.
 2541A
 SEP 14 1970
 UNDER THE FEDERAL INSECTICIDE FUNGICIDE AND RODENTICIDE ACT FOR ECONOMIC PESTION REGISTERED UNDER NO. 10330-2 SUBJECT TO ATTACHED COMMENTS

DIRECTIONS

FOR USE OF
ETHYLENE GAS
See Back Cover and Inside

UNION CARBIDE CORPORATION
LINDS DIVISION

270 PARK AVENUE, NEW YORK, N.Y. 10017

PINEAPPLE PLANT: 2.5 lb./acre To induce flowering. When plant is mature. Apply as pressure spray using 500-800 gallons water/acre vegetable growth. Use of ching 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 directed 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 19.4 cubic feet). The treatment rate can be calculated using the following formula:
 (Machine speed, MPH) (12) (Treatment width ft) (Recommended application rate, cubic ft per acre) = 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 germinates 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 or under supervision of USDA personnel only. Sequential applications with other herbicides will 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. Egan, USDA Witchweed Method Development Laboratory, Wainville, N.C.



BEST AVAILABLE COPY



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 90°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 door 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 on 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 it 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, 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 min.
- For Rooms between 5,000 and 10,000 cu. ft.: 1 cu. ft. per min.
- For Rooms over 10,000 cu. ft.: 2 to 2 1/2 cu. ft. per min.

THOROUGH VENTILATION ESSENTIAL. It is customary to treat the fruit 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.



BEST AVAILABLE COPY