



PACKINGHOUSE NEWSLETTER

W. Wardowski, Editor
AREC
700 Experiment Station Road
Lake Alfred, FL 33850

Packinghouse Newsletter No. 122
October 28, 1981

Phone (813) 956-1151

Key Word Index Caribfly Fumigation, Fumigation, Medfly, Quarantine

MEDITERRANEAN FRUIT FLY, FUMIGATION AND QUARANTINE: PART II

I. Legal Authority

The legal authorities for Regulatory and other actions under State and Federal law are:

1. Chapter 581 of the Florida Statutes.
2. Emergency Rule #5BER81-3 entitled "Florida Mediterranean Fruit Fly Rule and Quarantine."
3. The Federal Plant Pest Act.

II. Quarantine Treatment and Handling

All regulated articles, which include all citrus varieties, leaving a regulated area must be certified as free of Medfly eggs, larvae and adults.

The following treatment may be harmful to the fruit. Varieties differ in their ability to withstand treatment. Neither the Florida Department of Agriculture and Consumer Services, Division of Plant Industry, nor the USDA will be responsible for damage resulting from treatment.

1. Treatment:

- A. Fumigation with ethylene dibromide (EDB) at normal atmospheric pressure in a USDA approved fumigation facility with technical grade EDB uses the following dosage rates:

Fruit load % of chamber occupied	Dosage of EDB in ounces (by weight) per 1,000 cu. ft. of chamber space*	
	Pulp temperature ranges	
	60° - 70°F	70°F and above
25% or less	10	8
26% - 49%	12	10
50% or more	14	12

*1 oz per 1000 cu. ft. is almost exactly 1 gram per cubic meter.

- B. Calculation of dosage. To calculate the dosage by weight in ounces - divide the cu. ft. volume of the chamber by 1,000, then multiply the quotient by the dosage rate as expressed in ounces per 1,000 cu. ft. to obtain ounces per chamber. When the dosage is to be measured in milliliters (ml), multiply by 13.05 (ml per ounce). Example for 12 ounce dosage rate in a 4,200 cu. ft. chamber:

$$\frac{4,200}{1,000} \times 12 = 50.4 \text{ ounces/chamber}$$

$$50.4 \times 13.05 = 657.72 \text{ ml/chamber}$$

2. Handling certified citrus. Citrus fruit may be certified as originating in a non-regulated area or as having been properly treated and may maintain this certified condition when stored or processed in an area equipped to restrict the entry of Medfly. Methods of preventing Medfly entry must be approved by an authorized representative of the USDA or of the Florida Department of Agriculture and Consumer Services, Division of Plant Industry. Examples of precautionary methods are:

- A. Completely closed storage rooms or processing areas with proper precautionary handling to prevent the entry of Medfly.
- B. Storage rooms or processing areas screened or with curtains that will inhibit the entry of the Medfly.
- C. Storage rooms or processing areas equipped with air screens that will inhibit the entry of the Medfly.

III. Elimination of EDB following fumigation: EDB is absorbed by citrus fruit and by the shipping containers during fumigation. Desorption of this EDB is extremely important both from the standpoint of meeting tolerances set by government agencies, and in view of the damage to the fruit that may occur if necessary precautions are not taken.

1. Government tolerances:

- A. The Occupational Safety and Health Administration (OSHA) has a tolerance in the work place of 20 ppm in the atmosphere averaged over an 8 hour period. National Institute of Occupational Safety and Health (NIOSH) has suggested to OSHA a tolerance of .13 ppm (130 ppb) which, with present technology, is difficult if not impossible to meet.
- B. The Environmental Protection Agency (EPA), in its 4 year long examination of the EDB registration, indicated a preference for the .13 ppm tolerance if EDB registration is continued.
- C. The Food and Drug Administration (FDA) has a tolerance of 10 ppm inorganic bromide.

2. EDB damage to fruit. Aeration for 1 hour in the chambers, plus 24-48 hours in transit is required to prevent fruit damage. Warehouses used for storage of fumigated fruit during the first week following fumigation must be equipped to exchange and recirculate air through the stored fruit to prevent

damage, and minimize EDB levels in the working areas.

IV. Fumigation Facilities

Fumigation facilities may take various forms. In general, they are air tight enclosures equipped with fans to provide proper circulation of gases through the load.

1. Chambers: Must be USDA approved. Versions that have received approval include:
 - A. Special enclosures for the purpose of fumigation constructed of concrete block, plywood, galvanized steel, or other approved materials, and with equipment for proper circulation of gases.
 - B. Ripening or degreening rooms converted to provide the proper airtight condition and circulation of gases. Most Florida citrus degreening rooms cannot be economically converted because fabric doors and walls are not airtight.
 - C. Van-truck bodies such as semi-trailers tested for airtightness and with equipment for proper circulation of gases. Experience has shown that trucks and trailers operated over the road do not maintain their airtight condition due to stresses which occur in travel. Approved van bodies would be limited to use at one location and subject to frequent inspection.
2. Circulation: EDB vapor is 5-1/2 times as dense as air. Due to this weight difference, the air and gas mixture must be continuously recirculated to prevent stratification. EDB readily diffuses downward and laterally, but only slowly upward. The following requirements must be met to accomplish proper circulation.
 - A. Fans must be capable of recirculating the air-gas mixture one time per minute. Example: A 10,000 cu. ft. chamber must have fans capable of moving 10,000 cu. ft. of air per minute.
 - B. Fans must be equipped with the intake at floor or below floor level.
 - C. The exhaust orifice must be above the load preferably immediately below the ceiling.
 - D. Chambers must be equipped with sub-floors or slatted floors. Pallets may be used in lieu of sub-floors or slatted floors.
3. Equipment for dispensing EDB.
 - A. For safety, a closed system should be used for measuring liquid EDB. Such a system must be designed to meet the needs of the individual operation. Contact R. E. Brown (see below) for details.

- B. Vaporizing EDB: The most economical, readily available device for evaporating EDB is a stainless steel frying pan. Other heating devices such as hot plates with pans, etc., can be used, but, may not last as long. Liquid EDB is very corrosive to certain plastics and metals, particularly aluminum.

Ralph Brown
 Division of Plant Industry
 Florida Dept. of Agriculture
 & Consumer Services
 P. O. Box 1269
 Gainesville, FL 32602
 Phone (904) 372-3505

RADIATION SEMINAR

A technical seminar: "Chemistry, Biological Effects and Dosimetry of Ionizing Radiation"

by

Dr. Michael G. Simic, Center for Radiation Research
 National Bureau of Standards, Department of Commerce
 Washington, DC

will be held at: 1:00 PM, Tuesday, November 24, 1981
 Agricultural Research and Education Center, Lake Alfred, FL

AVAILABLE PUBLICATIONS

Available from Dr. W. Wardowski, AREC, 700 Expt. Stn. Rd., Lake Alfred, FL 33850

"The Mediterranean Fruit Fly" by J. L. Knapp. Univ. of Florida, Cooperative Extension Service, ENT-54. 4 pages.

"Disposition and Air Dispersal of Ethylene Dibromide from Fumigated Citrus" by W. M. Miller, M. A. Ismail, and J. O. Craig. TRANSACTIONS ASAE, 24(4):1050-1053, 1057. 1981.

"Twentieth Annual Citrus Packinghouse Day" by W. F. Wardowski (ed.). (Program)

"Thirty-second Annual Citrus Processors' Meeting" program for October 1, 1981.

Available from Dr. Mark Sherman, Vegetable Crops Dept., 1217 HS/PP Building, Univ. of Florida, Gainesville, FL 32611

"Handling Florida Vegetables" by M. Sherman (ed.). Special issue devoted exclusively to Mediterranean Fruit Fly. Handling Florida Vegetables 81-3. Sept. 9, 1981.

This newsletter is published at a cost of \$110.67 or 9 cents per copy, to give the latest news to the packinghouse industry.

W. Wardowski
 W. Wardowski, Editor
 Professor
 Extension Horticulturist