

TITLE 7 - AGRICULTURE
CHAPTER III - BUREAU OF ENTOMOLOGY AND PLANT QUARANTINE
PART 301 - DOMESTIC QUARANTINE NOTICESWHITE-FRINGED BEETLE ADMINISTRATIVE INSTRUCTIONS MODIFIED
TREATMENTS AUTHORIZED

Introductory note. Recent investigational work has shown that it is possible to destroy all stages of the white-fringed beetles (Pantomorus spp.) in soil, with either carbon disulphide or methyl bromide applied as a liquid, provided the temperature of the soil is sufficiently high and the period of exposure is long enough. The administrative instructions in this circular, specifying the various authorized methods of treatment of plants in soil, and of potting soil, are therefore hereby revised by authorizing the above treatment for soil plots, plunging beds, and potting soil (see paragraph (c)).

All treatments apply to the various species of white-fringed beetles.

This circular supersedes all instructions in Circulars B. E. P. Q. 486, 489, and previous issues of 503.

§ 301.72-5c* Administrative instructions - Treatments authorized. - Pursuant to the authority conferred upon the Chief of the Bureau of Entomology and Plant Quarantine by paragraph (a) of § 301.72-5, Chapter III, Title 7, Code of Federal Regulations [Regulation 5 of Notice of Quarantine No. 72 on account of the white-fringed beetle], the following methods of treatment are hereby authorized effective January 9, 1942, when carried out under the supervision of an authorized inspector of the United States Department of Agriculture.

(a) Plants in pots or in soil balls.

(1) Methyl bromide fumigation at atmospheric pressures. (i) Fumigation must be done with methyl bromide at a dosage of 1 pound per 1,000 cubic feet, including the space occupied by the plants, for a period of 4 hours, the soil masses and the air in the fumigation chamber to be at a temperature of not less than 85° F.

(ii) Such fumigation shall apply only to those plants in 3-inch pots or smaller, or in soil balls not greater than 3 inches in diameter when spherical or thicker than 3 inches if not spherical, and the plants shall be stacked on racks so that the gas mixture can have access to all sides of the pots or the soil balls.

(iii) The fumigation shall be done in a tight chamber with gas-tight doors.

* Superseding §§ 301.72-5a and b.

(iv) After the chamber is loaded and closed, the appropriate amount of methyl bromide shall be volatilized therein, and the air-gas mixture shall be circulated by means of a fan or blower throughout the entire 4-hour fumigation period.

(v) The use of a fumigation chamber, lined with sheet metal throughout and with a metal-covered door closing against gaskets and held tightly in place by refrigerator door fasteners, is recommended.

(2) Methyl bromide fumigation under partial vacuum. (i) Fumigation under partial vacuum equivalent to at least 24.5 inches of mercury must be done with a dosage of 4 pounds of methyl bromide per 1,000 cubic feet of chamber space, including the space occupied by the commodity, with an exposure of $1\frac{1}{2}$ hours, the vacuum to be maintained throughout the entire period.

(ii) The temperature of the soil balls shall be 75° F. or above, and the diameter of the soil balls shall be not greater than 11 inches if spherical, or thicker than 11 inches if not spherical.

(iii) The fumigant-air mixture shall be circulated in the fumigation chamber by means of a fan the first 15 minutes of the exposure period to mix the vaporized fumigant thoroughly with the air in the chamber and bring it in contact with the surface of the soil balls. The soil balls shall be washed with one or more changes of air at the end of the exposure period.

(iv) A standard vacuum fumigation chamber which can be closed tight and will withstand an external pressure of at least one atmosphere is required. A vacuum pump of sufficient capacity to reduce the pressure within the vacuum chamber to the equivalent of 3 inches of mercury (a 27-inch vacuum at sea level) in not more than 20 minutes is necessary.

(3) Methyl bromide solution. (i) Treatment method. (Applicable to all regulated areas.)

(a) The soil balls around the roots of plants must be buried in sand and plunged in boxes or trays which are watertight and approximately 1 foot deep.

(b) A 2-inch space filled with sand shall be provided between the soil balls, also above and beneath them.

(c) Such soil balls shall be treated with a solution of methyl bromide and alcohol at a concentration of 0.3 percent methyl bromide and 0.6 percent denatured ethyl alcohol by volume in water. The solution is to be prepared by first mixing the methyl bromide and alcohol together and then adding this mixture to the water and mixing thoroughly.

(d) The aqueous solution of methyl bromide and alcohol shall then be applied evenly over the surface of the sand around the plants at the rate of 40 gallons per 100 square feet of surface area by means of a sprinkling can or sprayer.

(ii) Type of material, exposure, and temperature.

(a) In Orleans Parish, including the city of New Orleans, Saint Bernard Parish, and regulated parts of Jefferson and Plaquemines Parishes, La., the treatment shall be applied only to plants in soil balls not greater than 7 inches in diameter, nor greater than 7 inches in thickness when not spherical. After the required dosage has been applied, the soil balls shall remain embedded in the sand for a period of 8 hours. The temperature of the soil balls during the treatment shall not be lower than 65° F.

(b) In all regulated areas other than Orleans Parish, including the city of New Orleans, Saint Bernard Parish, and regulated parts of Jefferson and Plaquemines Parishes, La., the treatment shall be applied to soil balls not greater than 8 inches in diameter nor greater than 8 inches in thickness when not spherical. After the required dosage has been applied, the soil balls shall remain embedded in the sand for a period of 6 hours. The temperature of the soil balls during the treatment shall not be lower than 62° F.

(b) Potting soil.

(1) Carbon disulphide fumigation. (i) Potting soil shall be treated in a container with carbon disulphide at a dosage of 2 pounds per cubic yard of soil for a period of 48 hours.

(ii) The grade of carbon disulphide shall be comparable to U. S. P. grade having a specific gravity of 1.25 at 68° F.

(iii) The container shall be tight, preferably lined with sheet metal, and shall have a tight cover or be covered with a tarpaulin immediately after the fumigant is applied. The container shall not be more than 36 inches deep.

(iv) The soil shall be friable, and wet soil shall not be treated by this method. The fumigant shall be applied to the soil in holes 3 inches deep, the dosage to be evenly divided among holes 1 foot apart over the surface of the soil, and the fumigant shall be covered with soil as soon as it is applied.

(v) The temperature of the soil shall not be lower than 40° F. during the entire time of treatment.

(vi) The condition of the soil and the apparatus used and the method of application of the fumigant must meet with the approval of an authorized inspector of the United States Department of Agriculture.

(2) Methyl bromide fumigation. (i) Potting soil must be treated in a container with methyl bromide in a dosage of 40 cubic centimeters of methyl bromide per cubic yard of soil for a period of 48 hours.

(ii) The sides, bottom, and seams of the container shall be tight, preferably lined with sheet metal, and shall have a tight cover or be covered with a tarpaulin immediately after the fumigant is applied.

(iii) The temperature of the soil shall not be lower than 40° F. during the entire time of treatment.

(iv) The condition of the soil and the apparatus used and the method of application of the fumigant must meet the approval of an authorized inspector of the United States Department of Agriculture.

(3) Heat treatment. (i) Live steam, under pressure of 80 pounds or more per square inch, shall be applied through a grid of perforated pipes at the bottom of the sterilizing box or truck body containing the soil, for a period of 45 minutes or until all parts of the load reach a temperature of 200° F.

(ii) The grids shall be constructed of 1-inch pipes, perforated with holes 1/32 inch in diameter on the upper side and connecting at one end to a manifold into which the steam is introduced.

(iii) The layer of soil in the sterilizing box shall not be more than 2 feet, 6 inches deep.

(4) Methyl bromide and carbon disulphide. (See instructions in paragraph (c).)

(c) Soil plots, plunging beds, and potting soil.

(1) Methyl bromide. (i) Inject the liquid methyl bromide into the soil at a depth of 6 inches by means of a hollow needle or other suitable injector at the rate of 4.7 milliliters per square foot or 7 milliliters per 1½ square feet of soil surface.

(ii) After treatment has been applied to the plot the soil should be covered with 10- or 15-pound building paper, lapped 4 inches and weighted down so that it will not be blown off.

(iii) The soil must be at a temperature not lower than 45° F. at a depth of 6 inches when the treatment is applied. At temperatures from 45° to 62° inclusive the soil must be kept covered for a period of 6 days to insure complete mortality of all eggs, larvae, pupae, and adults of the insect which may be present in the soil under treatment. At temperatures above 62° the soil must be kept so covered for a period of not less than 4 days.

(2) Carbon disulphide. (i) The insecticide shall be applied at the rate of 33 milliliters per square foot of soil surface, the liquid to be poured into holes at least 6 inches deep and 1 inch in diameter at the top, and covered immediately with earth.

(ii) After application the plot should be covered with 10- to 15-pound building paper which shall remain in position for at least 4 days in order to insure complete mortality of any eggs, larvae, pupae, or adults of white-fringed beetles that may be present.

(iii) The treatment shall not be applied to soil which is below 80° F. in temperature at a depth of 6 inches.

(d) Disclaimer. There has been opportunity to test these treatments on only relatively few varieties of plants and in authorizing the movement of potted plants, nursery stock, or soil treated according to the requirements stated above, it is understood that no liability shall attach either to the United States Department of Agriculture or to any of its employees in the event of injury to either plants or operators.

(e) Caution. (1) Methyl bromide. (i) Methyl bromide is a gas at ordinary temperatures. It is colorless and practically odorless in concentrations used for fumigation of plants or potting soil. It is a poison and the operators should use gas masks approved by the United States Bureau of Mines for use with methyl bromide, when exposed to the gas in concentrations used in fumigation, or while preparing the solution. The plants in the fumigation chamber should be well aerated by blowing air through them, and the room adequately ventilated before it is entered. After fumigating the potting soil by methyl bromide the cover should be removed and the soil allowed to become aerated.

(ii) The method for application of methyl bromide described in paragraph (c) provides a closed system in which the operator is not exposed to a dangerous concentration of the gas provided there is no leakage in any exposed portion of the equipment. Extreme care should be exercised to keep all joints of such apparatus tight and replace any defective parts to prevent accident. The operator should avoid getting any liquid methyl bromide on his clothing or his body at any time.

(2) Carbon disulphide.

(i) The vapor of carbon disulphide is inflammable and explosive. At a temperature of 297° F. it may take fire spontaneously and in the presence of certain metals, particularly copper, it may ignite at considerably lower temperatures. It must be kept away from fire, and from hot objects such as electric light bulbs, unprotected brush-type motors, steam pipes, etc. Lighted cigars, cigarettes, or pipes must never be brought near carbon disulphide.

(ii) Carbon disulphide is a blood poison, but poisoning by this chemical is rare. Exposure to the vapor may cause giddiness and headache. When these symptoms develop, the individual should get into the open air.

(7 C.F.R., § 301.72-5; sec. 8, 39 Stat. 1165, 44 Stat. 250; 7 U.S.C. 161)

Done at Washington, D. C., this 6th day of January 1942.

P. N. ANLAND,
Chief.



1. The purpose of this study is to determine the effect of the treatment on the growth of the plants.

2. The first part of the study is to determine the effect of the treatment on the growth of the plants.

3. The second part of the study is to determine the effect of the treatment on the growth of the plants.

4. The third part of the study is to determine the effect of the treatment on the growth of the plants.

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12. The eleventh part of the study is to determine the effect of the treatment on the growth of the plants.

13. The twelfth part of the study is to determine the effect of the treatment on the growth of the plants.