
 * Mimeograph Nov. 1949 *
 * Paper No. 66 GEORGIA COASTAL PLAIN EXPERIMENT STATION 1/ Revised: *
 * Tifton, Georgia Jan. 1953 *
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 * Information based on results of practical experiments in *
 * agriculture for press release and distribution to farmers *
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TOBACCO ROOT-KNOT CONTROL BY SOIL FUMIGATION

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Soil fumigation effectively controls nematode diseases such as root knot. It is profitable if there is sufficient disease to materially reduce crop yields. While 3-year crop rotations are recommended for root-knot control, fumigation promises to fill the need for supplementary control where there is insufficient land for these rotations. A single treatment can be relied on for only one season. Unless the fumigants are applied at the right time and in controlled amounts, they may cause poor stands, retard growth or be ineffective against nematodes. The materials must be used with caution because they contain bromine or chlorine, either of which reduces leaf quality when absorbed in excessive amounts. Since the long-time effects of continuous fumigation are unknown, it is safer to fumigate in conjunction with short rotations than to treat the same field every year.

Fumigation Materials: Two volatile liquids have been used. One is a 40% ethylene dibromide mixture (EDB-40) sold as Dowfume W-40, Fascofume-40 and other trade names. The EDB may also be emulsified for diluting with water to prepare a home-made EDB-40 mixture, as is done with Miscible Soilfume-75. The other liquid is a crude dichloropropene-dichloropropane mixture known as D-D. When poured into the soil, these liquids form gas which kills root-knot and certain other nematodes.

Equipment for Applying: Tractor-mounted applicators with pumps to deliver controlled rates through several delivery tubes are suitable for large fields and for broadcast fumigation. A small gravity flow rig with a single tube mounted on a plow stock or tractor is practical for row treatments in small fields. Gravity flow tanks should be provided with an air-tight filler cap and a breather tube or other device to permit a uniform rate of flow. A one-horse rig consists of a 2-gallon tank which rests on the plow beam or handles, and this is equipped with an adjustable valve for regulating the rate. A flexible delivery tube extends from the valve to the rear of the plow foot. The lower end of this tube is fastened to the bottom of the plow foot and just in the rear of a small 2-inch plow. Be sure to clean out the tank and valve occasionally and strain the liquids into the tank.

How to Apply: Row treatment is the most economical method of application and this consists of pouring a single continuous stream under each row. The liquid is released in the bottom of the furrow and immediately behind the plow foot in such a way that it is automatically covered with soil the instant it touches ground. This is necessary to prevent loss of vapors. A turnplow or disk hiller following closely behind the rig can be used to prepare the row bed; With tractors it is best to treat and bed in the same operation. Treat 10 inches deep on drier upland soils and 6 inches on wet lowlands. For broadcast treatments the plow shanks are spaced 12 inches apart and each is equipped with a delivery tube. If preferred, the fumigant may be applied in the furrow immediately in front of the turnplow wing at the time of turning the land. The soil should be smoothed with a drag immediately after broadcasting.

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