

## TEST OF SOIL FUMIGANTS IN MISSISSIPPI

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This paper is a progress report on a study of soil fumigants in a Mississippi Forestry Commission nursery. The objectives are to devise an economical way to control root diseases and weeds.

### Site

The test is at Winona Nursery, Winona, Mississippi, in areas infected with root rot and nutgrass. In the last 2 years as much as 50 percent of the yellow-poplar in these areas died. Hand weeding ran as high as \$500 per acre.

### Methods

The fumigants included in this study are methyl bromide, trizone, and Vorlex (Methyl isothiocyanate).

Prior to treatment, the soil was plowed and disked. The fumigation was applied under the direction of Dr. Ted Filer, Southern Hardwoods Laboratory, Stoneville, **Mississippi**, between March 11 - 30, 1966. Each chemical was applied to one or more riser lines.

Nurseryman John H. Little applied the methyl bromide at the rate of 396 pounds per acre, from 1-pound cans under prior-laid polyethylene covers.

Trizone was injected into the soil with a machine designed by Dow Chemical Company. Mr. W. O. Miller applied it at the rate of 200 pounds per acre. Part of this application was water-sealed and part covered with polyethylene tarps.

Vorlex was applied at the rates of 40 and 45 gallons per acre by Messrs. H. A. Williams and Sidney Stephens of the Morton Chemical Company. They used a special machine to inject this chemical into the soil. After the application, the soil was cultipacked. One area of 2,000 square feet was covered with polyethylene.

Check plots were established in each area for each chemical treatment.

After 1) days, seedbeds were built and seeded with 12 different species. The beds received the usual irrigation, fertilization, hand weeding, and other cultural practices.

On April 26, 1966, a 4.15-inch rain fell on the nursery in less than 3 hours causing considerable washing and movement of soil in the treated areas. The yellow-poplar planted area received the greatest damage and during the summer, many seedlings died.

Weed counts were made on May 26, 1966. The Vorlex areas were weeded 1 week prior to the counts. The methyl bromide and trizone areas were not weeded prior to the counts. Soil samples were taken for laboratory studies to determine the extent and severity of root rots.

#### Results

Table 1 gives, for each treatment, the number of nutgrass stems counted on May 26. Methyl bromide gave the best control although the area on which it was used received the greatest damage from the April 26 rain. The treated area had 0.60 stems per square foot! whereas, the check area had 25.20.

While none of the Vorlex treatments were nearly as effective as methyl bromide, the best result obtained with it was the 45-gallon per acre rate. This treatment contained only 0.60 stems per square foot against 1.57 for the check. At the 40-gallon per acre rate, there were no advantages to covering the area after treatment. Both treatments contained 6.75 stems! whereas, the check contained 12.37 stems per square foot.

The trizone under cover was only half as effective as the water-sealed treatment. The covered treatment contained 8.25 stems; the water-sealed treatment contained only 4.35 stems; and the check had 12.08 stems per square foot.

We must wait on the result of laboratory tests before we will know how effective these treatments are in the control of root rot.

#### Conclusions

Although this test is incomplete, the results indicate that methyl bromide under polyethylene tarp is controlling nutgrass much better than the other two fumigants--trizone and Vorlex. No conclusions can be made on the control of root rot.

I wish to point out that the data for this study is incomplete and should not be published at this time. This is a progress report and the following points are emphasized.

Table 1.--Effect of fumigants on nutgrass<sup>1/</sup>

Treatment	Nutgrass Number/sq. ft.
Methyl bromide: 396 lbs./acre under tarp	00.60
Check	25.20
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Vorlex: 40 gals./acre	6.75
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Check	12.37
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Vorlex 45 gals./acre	.60
Check	1.57
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Trizone: 200 lbs./acre under tarp	8.25
Trizone: 200 lbs./acre water-sealed	4.35
Check	12.08

<sup>1/</sup> Counts made May 26, 1966.

1. Data in this report is for less than 1-year; therefore, the results are incomplete.

2. Part of the areas were flooded after the fumigants were applied and, therefore, may not show typical results.

3. The study should be repeated.