METHYL BROMIDE FUMIGATION FOR CARNATIONS

Richard H. Sciaroni, Arthur H. McCain, Bert Lear, and Roy L. Branson*

It has generally been assumed that steaming carnation ground beds would control nematodes, garden centipedes, and soilborne fungi. Soils new to carnations usually are not seriously infested with these pests. But it is increasingly apparent that in many carnation greenhouses, the Thomas method (stem lines on top of the soil) allows harmful organisms to build up. This is because heat seldom penetrates the soil more than 4 to 6 inches. As a result, major plant losses from soilborne pests have occurred.

There are several options that can be followed to do a better job in controlling soilborne pests. These include:

- The construction of raised or V-bottom benches. Steam sterilization can be more efficient on such benches. However, there is considerable expense involved in construction.
- Burying the steam lines 6 to 12 inches deep. This is expensive and is no guarantee against the roots growing below the treated area and becoming infected.
- Fumigating before planting with a Telone®-chloropicrin or D-D®-chloropicrin mixture. There is a hazard here because the chloropicrin fumes can injure plants growing in the same greenhouse or can drift to an adjoining greenhouse. Also, there is a waiting period of at least 2 to 3 weeks after fumigation with these mixtures before planting.

Respectively, Farm Advisor, San Mateo County; Extension Plant Pathologist, Berkeley; Nematologist, Department of Nematology, Davis; and Extension Soils and Water Specialist, Riverside.

In the past, fumigation with methyl bromide has not been considered because of continued reports of residual bromide injury on crops like carnations and snapdragons. However, recent information from Israel indicates that methyl bromide is being used successfully for preplant fumigation of carnation soils. Apparently the soils are sandy and the bromide is leached with irrigation water before planting. Because of the reports from Israel, investigations were started in the late summer of 1971 at Erica Nursery,[1] Half Moon Bay, on using methyl bromide fumigation for carnations. The soil type was a clay loam. Four plots of 50 square feet were treated as follows on September 17, 1971.

a. Methyl bromide was used at 1 lb./100 sq. ft. of area and not leached after fumigation.

b. Methyl bromide was used at 1 lb./100 sq. ft. of area and leached with approximately 1 gallon of water per square foot applied twice before planting.

c. Methyl bromide was used at 2 lb./100 sq. ft. of area and leached as B.

d. Thomas method of heat sterilization (steam lines on top of the soil). The soil was heated for approximately 2 hours until a temperature of 180 F was maintained for 30 minutes to about a 6-inch depth.

The methyl bromide was applied under a 4-ml polyethylene cover, which was tightly sealed to the soil. Both walks and ground beds were treated. Polyethylene covers were left on for 48 hours. Plots B and C received the leaching with irrigation water treatments immediately after polyethylene covers were removed. On September 27, all plots were planted to the carnation variety Improved White Sim.

RESULTS

Within 1 month after planting it was observed that the growth in plot A (1 lb. methyl bromide and no leaching) was not as good as plots B (1 lb. methyl bromide with leaching) and C (2 lb. methyl bromide with leaching). This indicates that residual bromide or methyl bromide injury

---

[1] *The authors are indebted to David Giacchino of Erica Nursery and Robert McKeond, Neil A. MacLean Company, Milpitas, for their cooperation and assistance.*

could be involved in plot A. No foliage symptoms other than reduced growth in plot A were observed but this difference was clear-cut right to the cross-boards that divided the different treatments. On January 14, 1972, the differences in growth were still visible. Plot C was the most vigorous, followed by B. Growth in plot D (Thomas method steam sterilization) was similar to that in A.

As a result of these experiments, the grower treated approximately 3,500 square feet of area at the rate of 1 pound of methyl bromide per 100 square feet. This was followed by the irrigation leaching treatment of 1 gallon of water per square foot applied twice before planting. The varieties Improved White Sim and Dusty were planted about December 15. No injury has been observed to date.

Reprinted from Flower and Nursery Rept., Univ. of California Agric. Extension Service, Berkeley, Calif.

CONCLUSIONS

In these tests it was apparent that methyl bromide fumigation of a carnation soil was effective and safe if fumigation was followed by leaching with irrigation water. The full effects of soilborne pest control with methyl bromide over the long period have not been determined. However, experience with other crops indicates that results should be satisfactory provided the problem of residual bromide injury does not occur.

The question of whether methyl bromide can be used on a 2-year schedule has not been investigated. For this reason, it is suggested that carnation growers who have difficulties with their present technique of soil sterilization try methyl bromide fumigation on a test-plot basis. In addition to controlling nematodes, garden centipedes, and most soilborne fungi, methyl bromide does a good job of weed control.

Your editor,

W D Holley

COLORADO FLOWER GROWERS
ASSOCIATION, INC.

OFFICE OF EDITOR
W. D. Holley
Colorado State University
Fort Collins, Colorado 80521

FIRST CLASS