

Methyl Bromide Injures Carnations

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Don't use methyl bromide fumigants on soils to be planted to carnations. Plants can be injured seriously if set into soil sterilized with methyl bromide. Growers in New York State and the surrounding territory have reported considerable variation in the effect of methyl bromide on carnation. However, our tests show that injury can occur in almost any soil if conditions are favorable. Don't risk injury to your carnations.

Injury to commercial carnations was first observed in April 1950 in a Long Island greenhouse. In this instance the grower could not steam the soil and used methyl bromide to control a serious Rhizoctonia stem rot problem. The methyl bromide treatment controlled the Rhizoctonia and the weeds but caused serious plant loss. Several varieties were planted in both ground beds and raised benches treated with methyl bromide. Plants set in raised benches were more seriously injured than those in ground beds. Hardened plants were affected more than actively growing plants. Apparently all varieties were equally susceptible to methyl bromide injury.

Plant injury may vary from death of small areas of tissue to death of the entire plant. If plants are injured only slightly, small portions of leaves, stems, or flower buds may turn grayish green, gradually dry and eventually become straw color. Plants having these symptoms may recover in six to ten weeks.

If the injury is more severe, in addition to the leaf, stem and flower bud symptoms, one or more lateral shoots may turn grayish green, and gradually dry. The root system of an affected plant is usually quite poor with many brown roots. From a distance these foliage symptoms are similar to those of Alternaria branch rot. Although affected plants may survive, they rarely outgrow the injury.

The most severe injury appears first as a grayish green color of the entire plant or of many of the lateral shoots. The affected portions dry and become straw color. By the time the foliage symptoms are pronounced the roots have already started to decompose.

Numerous experiments conducted in commercial greenhouses and at the Ornamentals Laboratory have demonstrated that plant injury is roughly proportional to (1) the total colloidal content of the soil, (2) the soil temperature, and (3) the amount of methyl bromide applied. The colloidal content of a soil is made up of a clay fraction and an organic fraction. In some tests the organic content was increased by the addition of different amounts of well rotted leaf mold. Plant injury increased directly with the amount of leaf mold added.

Other tests with soils having different clay contents demonstrated a similar increase in plant injury with increase in clay content. In still other trials, the appearance of injury symptoms and the severity of injury was markedly influenced by temperature. As the temperature increased from 50 to 75°F injury appeared in two weeks instead of six to eight weeks. The effect of increasing the amount of methyl bromide applied is more obvious when higher soil temperatures prevail. During late fall and winter there is little difference in plant injury between a normal and a double rate of application. The methyl bromide mixtures such as Dowfume G and Bromex (formerly Iscobrome I) have caused somewhat less injury than would be predicted from the methyl bromide content. Other soil fumigants such as ethylene dibromide and chlorobromo-propene (CBP) can cause similar injury to commercial carnations.

The toxic residue, which we believe is bromine, can be removed by repeated, heavy flooding with water. In practice, however, the leaching required prohibits the use of the methyl bromide materials. No chemical antidote or cultural practice has been effective in reducing or eliminating the injury caused by the bromine residue.

However, methyl bromide can be used to sterilize the propagating sand. In two tests clean, sharp sand was placed in flats four inches deep, then treated for 24 hours with methyl bromide at the rate of 11 pounds per 100 square feet (almost three times the normal rate). Twenty-five to thirty cuttings each of Hercules, Dark Pink Virginia, red William Sim and white William Sim were placed in the flats 1, 3, 5, 7 and 13 days following methyl bromide fumigation. The general appearance of the foliage and the rooting of the cuttings in the treated sand were compared with similar cuttings in non-treated sand. There was no foliage injury on any of the cuttings in the methyl bromide treated sand nor was there any observable difference between cuttings in treated and non-treated sand in speed of rooting, amount of roots, and rate of root growth.

The commercial carnation appears to be extremely sensitive to bromine. With our present information we would not recommend the bromine-containing materials for treating carnation soil. If, for some reason, a bromine fumigant must be used, we strongly urge a small scale treatment under your own particular soil conditions.

Methyl bromide can be used safely for sterilizing clean sand in the propagating bench. Do not use methyl bromide if propagating medium is a mixture of sand and peat or sand and other organic material.

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Your Editor,

