# EFFICACY OF METHYL BROMIDE AND METHYL IODIDE AGAINST LESION NEMATODES HARBORED IN ROSE ROOTS

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Recently methyl iodide has been shown to be a very effective soil fumigant against soil-dwelling juveniles of *Meloidogyne incognita*, *Heterodera schachtii* and *Tylenchulus semipenetrans* (1, 2). However, one of the major advantages of methyl bromide compared to most other nematicides is its ability to penetrate plant residues such as old roots and eliminate parasitic nematodes living within plant tissues. Roots of perennials in orchard replant sites may remain relatively intact for months or even years after plant removal and harbor live plant parasitic nematodes.

This research was conducted on the Agricultural Operations Experimental Station of the University of California, Riverside. Round plastic containers (22.3 L) with drainage holes at the bottom were used as experimental units. The trial was designed as a randomized complete block with four replicates per treatment and was repeated once. The containers were filled with sandy soil. Small muslin bags were filled with 50 cc of the same soil and root pieces of roses grown in a field heavily infested with lesion nematodes, *Pratylenchus vulnus*. Two muslin bags per container were buried at a depth of 20 cm. One bag contained 1.5 g of 2 cm long root pieces each approximately 0.1 cm thick. The other bag contained 10 g root pieces, 2 cm long and each approximately 0.7-0.9 cm thick. Soil moisture at the time of fumigation was 10%. The temperature throughout the fumigation period varied between 24 C during the day and 15 C at night. Methyl bromide was cooled to -56 C for easier handling and pipetted into small gas-tight vials. These were kept on dry ice for transport to the plot. Methyl iodide was pipetted into similar vials and transported on ice. After placing a vial onto the soil



surface in the container and removing the vial caps, the containers were immediately covered with 4 mil (0.1 mm) black polyethylene tarp. The tarps were secured to the containers by rubber bands. Application rates for both fumigants were 0, 3, 6, 12, 24, 48 mM $m^{-2}$. The tarps remained on the

containers for four days. After the tarps were removed the containers were left for another day before the muslin bags were recovered. The bag contents were placed on Baermann funnels in a mist chamber for four days to facilitate nematode recovery and enumeration. Data from both trials were pooled based on homogeneity of variance and were analyzed by ANOVA. Means were separated by Fisher's LSD test ($p$=0.05).

The data confirmed the excellent efficacy of methyl iodide as a soil fumigant against plant parasitic nematodes. There was no significant difference in nematode survival between thin or thick roots. Methyl iodide penetrated the root tissue effectively. In comparison to methyl bromide the efficacy of methyl iodide was consistently superior.


1. Ohr, H.D., J.J. Sims, N.M. Grech, J.O. Becker, and M.E. McGiffin, Jr. 1996. Methyl iodide, an ozone-safe alternative for methyl bromide as a soil fumigant. Plant Disease 80, 731-735.
2. Becker, J.O., H.D. Ohr, N.M. Grech, M.E. McGiffen, Jr., and J.J. Sims 1998. Evaluations of Methyl Iodide as a Soil Fumigant in Container and Small Field Plot Studies. Pesticide Science 52, 58-62.