THE EFFECT OF SOIL CHARACTERISTICS ON METHYL BROMIDE DEPURATION RATES FROM BURIED ACTIVATED CARBON

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Abstract.

Following its use in postharvest chamber fumigations, methyl bromide (MB) can be captured by passing the ventilation effluent through a column of activated carbon. The captured MB can then potentially be reused for pre-plant soil fumigation by burying the activated carbon (AC) in the ground and allowing the MB to off-gas (i.e., depurate). The reuse of MB containing carbon in this manner would reduce the total amount of MB released into the stratosphere and increase the carbon content of the soil. An understanding of the factors which affect the rate at which MB is released from the carbon is critical to being able to dose for this technique. In a preliminary series of experiments the rate at which MB is lost from soil/carbon mixtures is determined as a function of soil characteristics, such as moisture content, packing density and organic matter content as well as carbon type. These results will be used to estimate the amount of MB containing carbon necessary to reach lethal CTs in future field tests.

Presentation Summary.

The purpose of this work is to examine the viability of using methyl bromide impregnated carbon for pre-plant soil fumigations. This would allow for a value added use of "spent" activated carbon while the slow release of MB over a relatively longer time frame can reach lethal CTs while using less MB.

In this work, activated carbon, dosed with ~10mg/g MB, is packed into soil in 50mL centrifuge tubes. The mass of the tubes is monitored to determine the rate at which MB desorbs from the activated carbon and leaves the soil. Physical characteristics such as: carbon depth, soil moisture, and packing density are varied as well as soil and carbon types to determine which variables have the largest effect on the kinetics of MB release. This data will be used to inform treatment methodology in pilot scale and real world studies.