METHYL IODIDE: AN EFFECTIVE REPLACEMENT FOR METHYL BROMIDE FOR WEED CONTROL

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Methyl bromide is a wide spectrum fumigant that is highly effective for weed control. The costs of the proposed ban on methyl bromide will be particularly severe in high value crops such as strawberries and fresh market tomatoes. None of the currently available alternatives have comparable efficacy. Our group has developed methyl iodide as a safe and effective alternative to methyl bromide. This paper will present our comparisons of methyl bromide and methyl iodide as fumigants for control of weeds, and includes experiments in three arenas: 1) laboratory, 2) artificially infested field containers, and 3) feral populations of purple nutsedge and annual weeds in a grower's field.

1) Laboratory: seeds of field bindweed, velvetleaf, purslane, and annual bluegrass were allowed to imbibe water and were then fumigated for two days with methyl bromide or methyl iodide at rates ranging from 0-1.69 uM/ml. Methyl iodide was the more effective herbicide at all concentrations. Field bindweed was the most difficult weed to control, with neither chemical achieving a complete kill.

2) Field, artificial infestation: seeds of annual bluegrass and field bindweed were mixed with soil, placed in cloth bags, and buried 15 cm deep in plastic containers that had been filled with blow sand. The containers were tarped and fumigated with methyl bromide or methyl iodide at mole equivalent rates of 0-355.7 mM/m^2. Methyl bromide and methyl iodide were equally effective in controlling either weed species. As in the laboratory experiment, neither chemical achieved 100% kill of field bindweed.

3) Field, feral weed infestation: A fine sandy loam field in the low desert with a long history of weed problems was disced and then irrigated. When dried to one-half field capacity, plots were tarped and

fumigated with methyl iodide or methyl bromide at the rate of 4.8 M/9.29m^2. Six weeks after fumigation, counts were made of weeds emerged on the surface of the plots. Both fumigants were effective but not significantly different in preventing weed seedling emergence.

Fifty days after fumigation, soil samples were taken at depths from 0-10 cm, 10-20 cm and 20-30 cm below the surface, placed on greenhouse flats, and kept moist to facilitate germination. Methyl iodide was more effective at killing nutsedge tubers at the 0-10 and 20-30 cm depths than was methyl bromide.

This paper is part of a three paper series comparing the efficacy of methyl iodide and methyl bromide. We have clearly demonstrated that methyl iodide is at least as effectively as methyl bromide in controlling a wide spectrum of pests. Methyl iodide is an effective alternative to methyl bromide that is both easier to use and safer for the environment.