PURPLE NUTSEDGE CONTROL WITH IODOMETHANE

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Iodomethane (methyl iodide) has been identified as the closest thing to a drop in replacement for methyl bromide among the fumigants being researched today. Handling and application procedures are very similar to methyl bromide, but iodomethane has some characteristics which differ from those of methyl bromide which make it unique. Among these characteristics is the specific gravity and volatility: iodomethane is heavier than methyl bromide and has a higher boiling point.

Much of the research conducted with iodomethane has focused on nematode and disease control with less emphasis on weed control, especially control of the nutsedges. Additionally, the research to date has involved various formulations of iodomethane with chloropicrin. The most common formulations have been 98% iodomethane /2% chloropicrin and 50%/50%, on a weight basis. Varying degrees of nutsedge control have been reported, but there has been little consistency among experiments. As a result, definitive information on the rate required to control purple nutsedge (*Cyperus rotundus*) is lacking. Since purple and yellow (C. esculentus) nutsedge have been identified as the most difficultly controlled soilborne pests for soil fumigants, a clear understanding of the rate required of each formulation of iodomethane is essential to development of iodomethane as a viable alternative. Therefore, an experiment was conducted during the fall of 2003 and repeated in the spring of 2004 to determine the required rate of 98/2 and 50/50 formulations of iodomethane for control of purple nutsedge. The two formulations of iodomethane were applied at five rates chosen to deliver approximately the same quantity of iodomethane in a range from 100 to 200 lbs. per treated acre (112 to 224 kg/ha) in 25 lb. (11.3 kg) increments. Methyl bromide was included at the standard commercial rate of 350 lb. per acre (392 kg/ha) and there was a nontreated control for comparison purposes. Applications were made through 3 standard backswept gas knives attached to a Kennco bed press. The knives were positioned 12 inches apart and delivered the fumigant 9 inches (23 cm) deep (1 inch or 2.5 cm below the base of the bed). Fumigants were applied to 28 inches (0.7 m) wide beds which were 20 cm tall and were spaced 1.5 m apart on center and were covered with low density polyethylene film.

Cucumber was grown in the fall experiment and tomato was grown in the spring study. Each experiment was situated in a field with a historically severe infestation of purple nutsedge. The fall study was initiated late in the season and little nutsedge emerged. Also, cucumber growth was poor and little meaningful data were collected. The spring study was much more productive. All rates of each iodomethane formulation reduced purple nutsedge emergence in the spring; however, applications of 98/2 were less efficacious than 50/50 on a unit per unit basis. The best control of purple nutsedge was obtained with 350 lb. per acre (392 kg/ha) of the 50/50 formulation which represented

approximately 175 lb. per acre (196 kg/ha) each of iodomethane and chloropicrin. The control was similar to that obtained with the standard rate of methyl bromide. Nematodes were not a significant factor in this study. The principal soilborne disease in the spring experiment was bacterial wilt with a 38% incidence level in the nontreated control plots. As one would expect, the 50/50 formulation provided better control of bacterial wilt, most likely as a result of the greater quantity of chloropicrin in the formulation, and there was no difference in control among the different rates of the 50/50 formulation or between them and methyl bromide. All fumigant treatments improved tomato fruit production compared to no fumigant, but there was little difference between the two formulations or among rates of iodomethane. Generally, yields were slightly higher with the 50/50 formulation.

This research is continuing in an effort to better define the rate of iodomethane required to be effective against nutsedge. At the present time, it appears that a rate in the range of 175 lb./treated acre (196 kg/ha) of iodomethane or higher is required to be effective with either formulation.