1,3-DICHLOROPROPENE ENHANCED DEGRADATION: DOES IT AFFECT EFFICACY?

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1,3-Dichloropropene, formulated with chloropicrin, has been identified as the likely alternative fumigant to replace methyl bromide when it is suspended. The fumigant has been monitored at a site at the University of Florida, Green Acres Research Farm in Alachua County for the past 3 years to determine its rate of degradation. The site has been fumigated annually or biannually for the last 12 years with 1,3-dichloropropene (1,3-D) at a rate of 56 to 140 liters/ha. It was determined that 1,3-D was completely degraded in 14, 7, and 5 days in 1994, 1995, and 1996, respectively. In 1997, both cis- and trans-1,3-D were completely degraded in less than 5 days, thus the degradation rate appears to have stabilized. Half-life values in 1997 for 1,3-D in the surface soil (0-15 cm deep) was 1 day for cis-1,3-D and 0.8 days for trans-1,3-D, and in subsurface soil (15-30 cm deep) it was 1.4 days for cis-1,3-D and 0.7 days for trans-1,3-D. It is important to determine if soils identified as enhanced for 1,3-D degradation reduces the efficacy of 1,3-D in the control of root-knot nematodes. Our objectives were to determine the length of time 1,3-D remains active after application and if enhanced soil reduces the activity of 1,3-D. The first experiment (objective one) was conducted in microplots heavily infested with *Meloidogyne arenaria*. 1,3-D was injected with a glass-teflon syringe 30 cm deep at 168 liters/ha. The plots were sampled 48 hours before fumigation and 6, 24, 48, 72, and 96 hours after fumigation and a bioassay was conducted on each soil sample. The roots were rated on a scale of 0-5 (0 = no galls, 5 **;** 100 galls). An average gall index of 1.25 (~10% of the root system galled) was detected 96 hours after fumigation. For the second objective, we chose two sites in close proximity. One was an enhanced soil site and the second had never been treated with 1,3-D. Both sites were heavily infested with *Meloidogyne incognita* race 1. The nematode population was maintained on hairy vetch throughout the winter and increased on soybean during the summer. Two treatments, replicated 10 times, were applied to the study sites: 1,3-D injected with a glass-teflon syringe 30 cm deep at the rate of 112 liters/ha and an untreated control. Plots, 1 m by 1.5 m, were sampled at 15, 30, and 45 cm deep 24 hours before fumigation and at 24, 48, 72, and 96 hours after fumigation. A bioassay is being performed on each soil sample using tomato, cv. Rutgers. Six tomato (cv. Solarset) seedlings were transplanted in the center of each plot. The plants remained in the soil 11 days and the roots are being stained with acid fuchsin to determine the number of juveniles per gram of root. The results of objective two are not known at the writing of this abstract.