PESTICIDAL PROPERTIES OF VOLATILE, LOW MOLECULAR WEIGHT, IODINATED HYDROCARBONS

R. Rodriguez-Kabana. and A. G. Appel, Department of Entomology and Plant Pathology, Auburn University, Auburn, Alabama 36849, U.S.A.

The relative nematicidal efficacy of iodomethane [C1], 1,2-diiodoethane [C2], 1,3-diiodopropane [C3] and 1,4-diiodobutane [C4] were studied in greenhouse experiments with a soil from a cotton field infested with the reniform nematode [*Rotylenchulus reniformis*]. The chemicals were obtained from Aldrich, Milwaukee, U.S.A. Emulsifiable concentrates of the compounds were prepared by dilution in acetone containing an emulsogen. For each chemical an aqueous emulsion with 0.2% [w/w] of the compound was prepared and was applied to soil at rates of 2, 4, 6, 8, 10, and 12 mgs a.i./Kg soil. The treated soil was mixed and transferred to 1L capacity 10-cm diameter cylindrical pots. Pots with untreated soil [control] and with treated soil were placed on a greenhouse bench in a randomized complete block design. Each treatment was represented by 14 replications [pots], one half of which were left uncovered and the other 7 were covered with polyethylene plastic bags [approx. 1 mil thickness] retained with a rubber around the pots. Soil samples for nematological analysis [salad bowl incubation technique] were collected 7-10 days after application of the materials. All rates of C1 failed to control the nematode in the covered and the uncovered pots. Numbers of the nematode in soil declined linearly in response to C2 rates; in covered pots applications of the material was particularly effective resulting in 100% kill with the 10 and 12 mg rates. All dosages of C3 and C4 eliminated the nematode in covered pots. In uncovered pots C3 was somewhat more effective than C4 at rates $\leq$ 6 mgs/Kg soil but applications of both compounds at the 3 highest rates resulted in 100% mortality.In a greenhouse experiment of similar design to the nematicide experiments, the C3 and C4 emulsions were applied at rates of 2-20 mgs a.i./Kg soil to a soil infested with crab grass [*Digitaria sanguinalis*], purple nutsedge [*Cyperus rotundus*], Jimson weed [*Datura stramonium*] and a variety of other weed species. All pots were covered and the number weeds were counted 7, 14 and 30 days after application of the chemicals. Results indicated that C3 was significantly more effective in controlling weeds than C4 and that rates $\geq$ 16 mgs/Kg soil were necessary to have satisfactory weed control.