COMPARATIVE STUDY ON THE NEMATICIDAL ACTIVITIES OF GARLIC AND MUSTARD OILS

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

The nematotoxic properties of mustard and garlic oils were compared with those of allyl isothiocyanate in a greenhouse study with a soil naturally infested with the reniform nematode [*Rotylenchulus reniformis*]. Five percent [v/v] acetone solutions of allyl isothiocyanate [Aldrich, Milwaukee, WI, U.S.A.], garlic oil [R. C. Treatt & Co., LTD, Suffolk, England] or mustard oil [NATUREX^{R}, Avignon, France] were prepared and each was delivered to soil at rates of : 0.1, 0.2, 0.4, and 0.8 mls a.i./Kg soil. Control and treated soils were placed in pots on a greenhouse bench and soil samples for nematological analysis [salad bowl incubation technique] were collected one week after application of the materials. The pots were then planted [5 seed/pot] with 'Young' soybean and the resulting plants were grown for 8 weeks when the plants were removed and soil samples were taken for nematological analyses. The weights of fresh shoots was determined and nematode populations in the roots was assessed as for the soil samples. Results from pre-plant samples indicated that all 3 materials were active against the nematode when applied at rates >0.2 ml/kg soil. The nematicidal activities of allyl isothiocyanate and mustard oil were several-fold higher than that of garlic oil. Numbers of the reniform nematode in end-of-experiment soil samples were lowest in soils treated with the two highest rates of allyl isothiocyanate and the 0.8 ml rate of mustard oil; numbers in soils with garlic oil did not differ from those in untreated soil. Nematode densities in the roots followed the same pattern as for the final soil samples except that the 0.8 ml rate of garlic oil reduced nematode density compared with the control. Treatments with allyl isothiocyanate and garlic oil had no effect on fresh shoot weights; however, those with mustard oil at >0.1 ml/kg soil resulted in improved shoot weights. Roots from mustard oil treatments had a healthier appearance than from other treatments or control. Results indicate clearly that garlic oil does not have the nematicidal properties shown by allyl isothiocyanate and mustard oil.