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Evaluation of soil texture and organic matter on atrazine degradation and its half-life

EBRAHIM IZADI DARBANDI¹, MOHAMMAD HASAN RASHED MOHASSEL¹, ESKANDAR ZAND²

¹*Ferdowsi University of Mashhad, Department of Agronomy, Iran*

²*Plant Pests and Diseases Research Institute, Weed Research, Iran*

Abstract

Atrazine is the most important triazine herbicides with moderately persistence in soil. In order to study the effects of soil texture and temperature on atrazine degradation, an experiment was conducted in completely randomised design with factorial arrangement and 3 replications. Eexperimental factors included, soil texture (sandy loam and silty clay) , organic manure (0, 2 and 5 percent(w/w)) and 4 incubation periods(0, 20, 40 and 60 days). Soil was contaminated with atrazine at a rate of 50 mg/kg soil. Results showed that soil texture and organic manure had significant effects on atrazine degradation rate. Atrazine degradation rate in clay soil with no organic amendment was 1.54 times higher than sandy soil and its half time were 130.6 and 90 days in two soil textures respectively. Atrazine degradation coefficient increased by 1.14 , 1.8 times in sandy soil and by 1.54 , 2.46 times in clay soil with 2 percent and 5 percent organic amendment, and the half-life decreased from 138.6, days to 121.57 and 77 days in sandy soil and from 90, days to 58.22 and 38 days in clay soil. It seems that atrazine persistence in clay soil is more than sandy soil and soil organic matters have an important role in atrazine bioremediation.

Keywords: Soil texture, atrazine, half-life, soil organic matter