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Evaluation of Soil Texture and Organic Matter on Atrazine Degradation and its Half-life

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Atrazine is the most important triazine herbicide with moderate persistence in soil. In order to study the effects of soil texture and temperature on atrazine degradation, an experiment was conducted in a completely randomised design with factorial arrangement and 3 replications. The experimental 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⁻¹ soil.

The results showed that soil texture and organic manure had significant effects on the atrazine degradation rate. Atrazine degradation rate in clay soil with no organic amendment was 1.54 times higher than in a sandy soil and its half-life time were 131 and 90 days in the two soil textures, respectively. The atrazine degradation coefficient increased by 1.14 and 1.8 times in sandy soils and by 1.54 and 2.46 times in clay soils with an organic amendment of 2 % and 5 %, respectively. The atrazine half-life time decreased with an organic amendment from 139 to 122 and 77 days in a sandy soil and from 90 to 58 and 38 days in clay soil with 0, 2 and 5 % organic manure application respectively. It seems that atrazine in clay soils is more persistence than in sandy soils and soil organic matters have an important role in atrazine bioremediation.

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