

Abstract

Metribuzin is one of the most important triazinone herbicides with moderately persistence in soil. This study was conducted to investigate the effect of different organic fertilizers on metribuzin persistence and degradation in field and laboratory conditions and evaluation use of rapeseed (*Brassica napus*. L) metribuzin soil residue determination. Field experiment conducted as a factorial arrangement in completely randomized block with 3 replications. Treatments included 4 different organic fertilizers municipal waste compost, poultry manure, cow manure and sheep manure, at 40 ton per ha⁻¹ with control treatment (non organic fertilizer application) and metribuzin application rate (750 and 1500 g. ha⁻¹ (WP %75)). For determination of metribuzin residue, soil sampling was taken from 0 to 15 cm soil depth at 0, 3, 7, 15, 30, 55, 90 and 120 days after application of metribuzin. Second experiment that conducted in laboratory controlled conditions at the rate of 5 mg. kg⁻¹ soil. Experimental factors included 4 organic fertilizers mentioned above (in 2.5% rate (w/w)) and incubation periods (0, 5, 15, 30, 50, 90 and 120 days). Metribuzin residue was measured with HPLC in both experiments. For metribuzin soil residue determination rapeseed was used for bioassay experiment in separately experiment. Field experiment results showed that metribuzin degradation rate increased with organic fertilizers application. Increasing in metribuzin application rate increased its soil residue, but it had not effect on metribuzin half life significantly. The lowest (46 days) and the highest (66 days) metribuzin half life was observed in municipal waste compost application and control treatment with no organic fertilizer application respectively. At laboratory conditions organic fertilizers had a significant effect on metribuzin degradation. The highest (120 day) and lowest (87 days) half life was observed in control treatment with no fertilizer application and municipal waste compost application respectively. Bioassay experiments showed that rapeseed root and shoot dry weight affected significantly with increasing metribuzin residue in soil, but its emergence was not affected. Based on ED₅₀ parameter the rapeseed root ED₅₀ (0.0609 mg.kg⁻¹ soil) sensitivity was higher than rapeseed shoot ED₅₀ (0.101 mg.kg⁻¹ soil) to metribuzin residue in soil. Results showed that rapeseed could be used as a bio indicator for determination of metribuzin residue in soil.

Key Words: Bioassay, Half life, Metribuzin, Persistence, Residue