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EFFECT OF NONIONIC SURFACTANT BRIJ 35 ON THE FATE OF METRIBUZIN IN A SANDY SOIL

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ABSTRACT Given the water scarcity endemic to a large portion of the globe, arid region irrigation has increasingly had to resort to the use of treated, partially treated, or even untreated wastewaters. These contain a number of pollutants, including surfactants. Applied to agricultural lands such surfactants could affect the fate and transport of other chemicals in the soil, particularly pesticides. A field lysimeter study was undertaken to investigate the effect of the nonionic surfactant, Brij 35, on the in-soil fate and transport of the commonly used herbicide, Metribuzin [4-Amino-6-*tert*-butyl-3-(methylthio)-1,2,4-triazin-5(4*H*)-one]. Nine PVC lysimeters, 1.0 m long × 0.45 m diameter, were packed with a sandy soil to a bulk density of 1.35 Mg m⁻³. Antibiotic-free cattle manure was applied (10 Mg ha⁻¹) at the surface of the lysimeters. Metribuzin was then applied to the soil surface of all lysimeters at a rate of 1.00 kg a.i. ha⁻¹. Each of three aqueous Brij 35 solutions, 0, 500, 5000 mg L⁻¹ (i.e., ‘good,’ ‘poor’ and ‘very poor’ quality irrigation water) were applied to three lysimeters. Analysis for metribuzin residues in samples of both soil and leachate, collected over a 90-day period, showed the surfactant Brij 35 to have increased the mobility of Metribuzin in soil, indicating that continued use of poor quality water could influence the pesticide transport in agricultural soils, and heighten the risk of groundwater contamination.

Keywords: Nonionic Surfactants, Brij 35, Metribuzine, Herbicide, Mobility, Lysimeter, Sandy Soil