Runoff and Percolate Losses of Pesticides from Turfgrass. (C05-easton113101-Oral)

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Abstract:

Pesticides found in ground and surface water can be problematic for humans and organisms which rely on clean water for consumption and habitat. This study was initiated to determine the factors influencing pesticide transport. Runoff and leachate from 37 natural precipitation events was analyzed for applied pesticides. Pesticide formulation greatly influenced runoff and leachate losses. 2,4-D (2,4-dichlorophonoxacetic acid), was detected in runoff at concentrations as high as 1236 ug L-1 with a mass loss of 1.42 g ha-1 in June 2001 (0.635% of applied). Comparatively, 2,4-D isoocytlester (2,4-D acid-isoctyl, 2ethel-hexyl-ester) formulation was never detected above 8.9 ug L-1. Strongly bound pesticides such as fenoxaprop (p-ethyl2-(4-((6benzozazolyl)oxy)phenoxyl) propanate) were never detected above minimum detection limits. Pesticides with short half lives (T1/2) and low organic carbon partitioning coefficient (Koc) values such as trichlorfon (dimethyl2,2,2-trichloro-1-hydroxyethyl)phosphonate) (T1/2 = 6 d, Koc = 15 cm3 g-1) exhibited rapid dissipation, and generally low losses provided that there was adequate foliar drying time. The highest concentrations in runoff were generally detected in the first event following application, and declined rapidly in subsequent events, while there was a lag in time between application and highest concentrations in leachate. Losses were strongly correlated with pesticide properties (Koc, T1/2, solubility, and volatility), environmental conditions (precipitation, soil type, hillslope

location), and time.

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