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Processes controlling the transportation of microplastics in agricultural soils

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Every year 12.5 million tons of plastic are used in agricultural production across the globe with plastic films accounting for 75% of this plastic. Once added to the soil, removing agricultural plastic is challenging as exposure to sunlight and other environmental elements fragment the plastics into macro- and microscopic pieces. In addition to this direct input, agricultural soils accumulate microplastics from several other sources e.g., biosoils input, runoff from roads and atmospheric deposition. Soils are usually thought of as sinks for plastic waste but growing literature suggests mismanaged agricultural soils could be significant sources of plastics to aquatic and other terrestrial environments. In this study, we investigated the process of microplastic movement in response to rainfall and overland flow. We compared the movement of two types of plastic (linear low-density polyethylene and acrylic) in two size fractions with sand particles in rainfall simulation experiments. We examine the extent to which plastic particles are preferentially eroded compared to fine sand particles, alongside the relative importance of particle size and polymer type for controlling the erosion of plastics from soil.