Phosphorus Pollution: Determining the Effect of Chelates on Phosphorus Sorption in Soil

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Phosphorus pollution occurs when too much phosphorus enters an environment through septic system wastewater or agricultural runoff. It is a major problem, as it can stimulate growths of plants and algae that negatively affect ecosystems, resulting in eutrophication. Laundry detergents today use chelates instead of phosphorus to capture metal ions, and this project sought to determine if chelates have an effect on the retention of phosphorus in soil. The experiment consisted of two parts: running a column test, in which different solutions of phosphate and Tide laundry detergent were poured through soil, and testing the phosphate concentration in the runoff using spectrophotometry. The results of this experiment were inconclusive. Although runoff including Tide had higher phosphate concentrations, it was discovered that Tide might have phosphorus in it. Additionally, the spectrophotometry method may have given inaccurate phosphorus concentrations, since solutions with Tide became cloudy during the preparation process and, although filtered, may not have been completely clear. The unknown concentrations of chelators and phosphorus in Tide solution also make it difficult to analyze the data. Future steps may include using only citric acid as a chelator, to eliminate the unknown factors of Tide solution.

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