Factors Affecting Phosphorus Release From Western Soils. (S11-westermann152516-Poster)

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Abstract:

Soluble P concentrations in irrigation runoff are affected by spatial, temporal and hydrological factors, as well as soil and water physical and chemical properties and their interactions. We evaluated P desorption kinetics of 18 western U.S. surface soil samples in different solutions. Soil samples were characterized using standard procedures (SERA-IEG 17. 2000. Southern Coop. Series Bull. No. 396. 102 p.). Air-dried soil (1, 2, 4, 10 g) was placed in 2 L of reverse-osmosis water, simulated irrigation water, or 0.01M CaCl2 in round plexiglass containers rotating continuously at 12 rpm at 20 C. Dissolved reactive P (DRP; 0.2 micrometer filtration) was determined by the molybdenum-blue method at selected time intervals. In general, 75% of the final DRP concentration was released in the first 15 minutes of soil-solution contact. Near equilibrium was achieved after four hours. Increasing solution ionic strength and/or calcium concentration decreased P desorption. DRP was best predicted by sodium bicarbonate extractable soil P concentration within a given solution. Development and use of algorithms containing contact time, sediment concentration, extractable soil P concentration, and other soil properties will be discussed.

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