Investigating the Mixing Concept for Phosphorus Loss in Furrow Irrigation. (S11-tabbara180157-Oral)

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Abstract:

In the literature, the loss of phosphorus (P) to runoff water has been examined predominantly under rainfall conditions where the kinetic energy of raindrops and the resultant turbulence in a thin layer at the soil surface, named the mixing zone, are the main factors causing the entrainment of dissolved P into the runoff. A series of experiments were conducted to investigate the mixing concept in furrow irrigation by using a laboratory flume 2.44 m long and 10.1 cm wide. The bed of the flume was a 10.0 cm deep Portnuef silt loam soil from Idaho. A 2.0 cm soil layer fertilized at 1.0 g P Kg-1 soil was placed at the surface and at 0.5, 1.0, 1.5 or 2.0 cm depth below the soil surface. Irrigation water (EC = 0.8 dS m-1) was applied to the flume from a constant-head tank and runoff water was collected and analyzed for dissolved reactive P (DRP). Initial results, with the fertilized layer at the surface, show that the transfer of P to runoff water is larger under no-infiltration condition. The effects of P placement, flow velocity and depth, and infiltration conditions on the DRP and its correlation with water-extractable soil P will be discussed.

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