Threshold Degree of Phosphorus Saturation (DPS) for Florida's Sandy Soils. (S11-nair095356-Oral)

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Abstract:

The need for an alternate indicator to traditional soil test P to assess the potential of P moving from a given site to surface waters via surface runoff or subsurface drainage is critical. The degree of P saturation (DPS) that relates a soil's extractable P to its P sorbing capacity would likely be an indictor of the P that will be mobilized from a soil system. Soil samples were collected from several manure-impacted surface and subsurface sandy soils in the Suwannee River Basin, Florida. We determined DPS as the percentage of oxalate-extractable P to the sum of oxalate-extractable Fe and Al (DPSOx) and compared the results with DPS calculated using Mehlich 1 (DPSM1) and Mehlich 3 (DPS M3) as the extractants for P, Fe, and Al. In all three cases of DPS calculations, it was noticed that the relationship between water soluble P (WSP) and DPS has an abrupt slope change at about 20% DPS (DPSOx = 20.1, CI= 16.6 to 23.7; DPSM1 = 19.8, CI=10.2 to 29.4; DPS M3 = 16.4, CI=11.8 - 20.9). These values agree well with weighted DPSOx > 25% being identified in the Netherlands as contributing to ground water pollution with P. If DPSOx=25% is taken as the threshold DPS value, then almost all surface manure-impacted soils (n= 72) and 20% of the subsurface soils (n= 254) that we evaluated will be an environmental concern.

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