Seasonal Fluctuations in Phosphorus Loss by Leaching from a Grassland Soil. (S11-sims112506-Poster)

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Abstract:
Effective environmental management of intensive grassland requires detailed understanding of the amounts and forms of soil phosphorus (P) loss to the environment. Repeated applications of fertilizer and manure have led to P accumulation in soils making them long-term P diffuse sources. This study was conducted on intact monolith lysimeters (50 cm diameter, 70 cm depth), which were collected from a Lismore silt loam soil (Udic Haplustept) under pasture. Treatments included applications of mineral P fertilizer (45 kg P ha-1) with and without farm dairy effluent (FDE: 200 and 400 kg N ha-1), and cow urine (1000 kg N ha-1). Flood irrigation (100 mm) was applied every three weeks between November and April. Leachate was collected after irrigation or a significant rainfall event and analyzed for dissolved reactive P (DRP) and total dissolved P (TDP) in a filtered (<0.45 mm) sample, and total reactive P (TRP) and total P (TP) in an unfiltered sample within 48 hours of collection. Examination of the seasonal pattern of P forms in the leachate indicated that total particulate P (TPP) was the dominant form in the leachate (77 % of TP) compared with total dissolved P (TDP) (23 % of TP) during the irrigation season (November - April). This was mainly attributed to greater

preferential flow, which increased physical dislocation of particulate bound P. During the non-irrigation season (May - October), the proportions of TPP (51 % of TP) and TDP (49 % of TP) in leachate were similar.

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