Selenium Uptake by Forage Species Grown on Phosphate Mining Waste Rock. (S11-mackowiak163649-Poster)

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Abstract:

As part of a series of studies on the mobilization and fate of selenium (Se) in the Permian Phosphoria Formation of southeast Idaho, Agropyron smithii Rydb., Bromus ineris Leyss., and Medicago sativa L. were grown in a greenhouse pot study using increasing proportions of 110 mg/kg Se phosphatic shale mining waste rock. The 1 kg pots contained 0, 1, 2.5, 5, 10, 25, 50, or 100% phosphatic shale with a loam soil making up the remaining mass. Above ground biomass was clipped several times over two growing seasons. Total Se tissue concentrations in the first clipping were above 100 mg/kg in the 50% and 100% shale treatments but tissue Se declined with successive clippings, most notably in the higher shale treatments. After two growing seasons, clippings accounted for approximately 5.8% of total substrate Se in the 1% shale treatment and 1.9% in the 50% shale treatment. Approximately 80% of this removal occurred within the first growing season. There were no differences in Se uptake among the three forages. Unlike field data that show alfalfa accumulates more Se than grasses, the confined roots in pot studies prevent alfalfa from 'mining' Se further down a soil profile.

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