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REMEDICATION - BRINE CONTAMINATED SOIL

TITLE – Phytoremediation of Brine Contaminated Soil (2005).

RESEARCH COOPERATOR – S. Gerrard - University of Saskatchewan.

TRIAL OBJECTIVE – To determine the effect of humic substances (**BLACK EARTH Mini-Granule**) on salinity (soluble sodium, Na) and sodicity (exchangeable sodium, Na) of brine contaminated soil grown with vegetations.

EXPERIMENT –

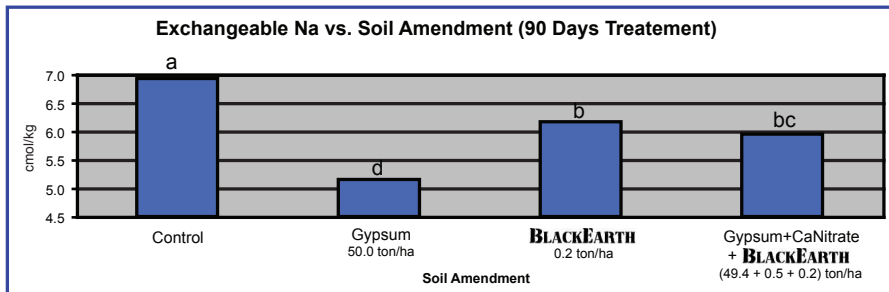
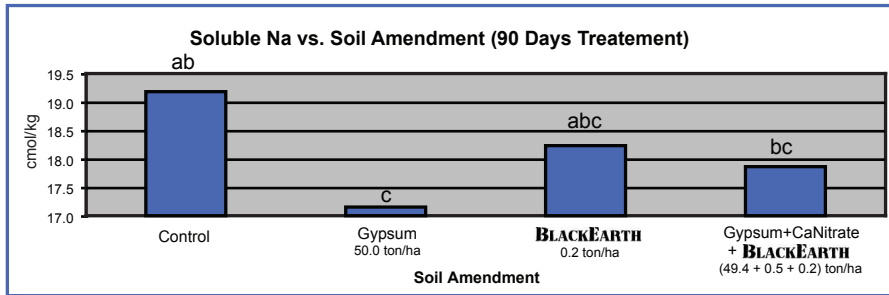
SOIL CHARACTERISTICS	
Type	Black Chernozem/Oxbow Assoc
Origin	Cannington Manor, SK
Texture	Silty clay loam
Contamination	Brine spill in 1960
pH	7.80
Electrical Conductivity (ds/m)	14.81
Soluble Na (cmol/kg)	18.72
Exchangeable Na (cmol/kg)	6.16

TREATMENTS	
Vegetation	Suaeda calceoliformis (paiute weed) + distichlis spicata (inland salt grass)
Soil amendment	Gypsum (CaSO ₄ 2H ₂ O) Calcium Nitrate (Ca (NO ₃) ₂) BLACK EARTH
Application rate	Gypsum = 50.0 ton/ha BLACK EARTH = 0.2 ton/ha Gypsum + Calcium Nitrate + BLACK EARTH = 49.4 + 0.5 + 0.2 ton/h
Period	Seedling to 90 days

TREATMENT & ANALYSES –

Tested soil was mixed with potting soil at 2:1 ratio and planted with seedlings. Soil amendments were gypsum, calcium nitrate, and BlackEarth. Combined suaeda calceoliformis (paiute weed) and distichlis spicata (inland salt grass) seedlings were planted in growth chamber for 90 days until harvest. Each treatment was repeated 3 times and replicated 2 times in time. ANOVA analyses ($P \leq 0.05$) were performed.

RESULTS AND DISCUSSIONS –



All soil amendments reduced both soluble and exchangeable sodium (Na) values in soil significantly through leaching and vegetative absorption. Values with different letters are significantly different at $P \leq 0.05$. Gypsum at 50.0 ton/ha performed the best. **BLACK EARTH** at a much lower rate (0.2 ton/ha) also performed well. Its performance could be improved by combining gypsum, calcium nitrate, and **BLACK EARTH** at 49.4, 0.5, and 0.2 ton/ha, respectively.



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