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The 21st International Grassland Congress / 8th International Rangeland Congress took place in Hohhot, China from June 29 through July 5, 2008.

Proceedings edited by Organizing Committee of 2008 IGC/IRC Conference

Published by Guangdong People's Publishing House

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Presenter Information

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Land application of biosolids to restore disturbed western rangelands

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Key words : biosolids, agronomic rate, disturbed rangelands, lime stabilized

Introduction Many rangelands in the western U.S. have been degraded through improper grazing. Biosolids are an inexhaustible resource that can be utilized to restore disturbed rangelands. Application of biosolids poses little threat to groundwater resources in areas with adequate groundwater depth because evapotranspiration generally exceeds total precipitation (Evans et al., 2001; Harris-Pierce et al., 1995). The current study compared effects of biosolids application to disturbed rangelands.

Materials and methods Biosolids were applied to private rangeland in Tooele County, Utah. A control plot served as a treatment performance baseline. The agronomic application rate of nitrogen (N) in tons/hectare was determined to be 168 kg of N/ha (McFarland, 2001). Biosolids were applied at 1X, 5X, 10X and 20X the agronomic rate. Soil and forage samples were taken from each .13 ha plot.

Results and discussion Nitrate concentrations increased with increasing depth. Phosphorus values were highest at the soil surface and decreased with increasing depth. Electrical conductivity was similar to that of nitrate while ammonia levels remained relatively low for all application rates. Treatment forage production ranged from 147 to 744 kg/ha compared to 94 kg/ha for the control. Forage crude protein levels were significantly greater for treatment (20%) than for control (10%).

Conclusions The increase in forage yield and quality underscored the value of biosolids land application while providing the following advantages in restoring disturbed rangelands: reduction in the use of costly, petroleum-based, fertilizers, reduced soil erosion, improved soil aeration/moisture infiltration, reduced water use (greater moisture retention capacity) and enhanced plant biodiversity.

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