

Crop and Soil Responses to Topsoil Replacement in Eroded Landscapes

Sharon Schneider^{1*}, Curtis Cavers², Apurba Sutradhar¹, Thomas Schumacher³, and David Lobb⁴

¹USDA-Agricultural Research Service, Brookings, SD; ²Agriculture and Agri-Food Canada, Brandon, MB;

³South Dakota State University, Brookings, SD; ⁴University of Manitoba, Winnipeg, MB

[*Sharon.Schneider@usda.gov](mailto:Sharon.Schneider@usda.gov)

At a severely-eroded site in South Dakota, with rates of tillage erosion as high as 58 tons per acre per year, evidence of topsoil movement from convex upper slope positions to adjacent concave, lower slope positions over time has exacerbated differences in soil properties and crop productivity between these landscape positions. The practice of soil-landscape rehabilitation (or landscape restoration) was conducted at this site in late 2005 and changes in soil properties and crop responses were monitored from 2006 to 2011. Reversing the outcomes of erosion through the addition of 15-20 cm of topsoil to the upper positions resulted in significant increases in crop yields and improvements in various soil properties, while using the lower landscape positions as the source of topsoil resulted in relatively minor reductions in crop yields and key soil properties. This demonstrates the practice of topsoil replacement can be effective in restoring productivity to eroded landscapes, with greater responses expected on more severely-eroded sites.