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Tillage-induced CO₂ loss across an eroded and restored landscape

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The increase in the carbon dioxide in the atmosphere related to concerns about potential global warming and prospects of using soil as a sink for carbon has attracted interest. Recent studies involving tillage methods indicate major gaseous loss of carbon immediately after tillage. This presentation describes spatial variation and differences in CO₂ losses as a result of tillage methods across an eroded landscape related to tillage intensity on the Skogstad site in west central Minnesota, USA. The measured CO₂ fluxes were largest with the moldboard plow > chisel plow > not tilled (before tillage). The spatial variation in CO₂ flux in the north-south transect was nearly four-fold immediately after plowing. A second part of the report will be evaluating soils CO₂ emissions after landscape restoration on the Retzlaff site. The CO₂ loss was partially related to soil chemical properties with lower CO₂ flux on the severely eroded sites. The CO₂ loss partially reflected the degradation of soil properties from tillage-induced soil translocation and as a result of wind and water erosion. This information will be of direct benefit to the farmers to enable them to maintain crop production with minimal impact on air quality and the environment.