**Site-specific digital soil maps inputs in simulating Maize Biomass and yield vs. The Soil Survey Geographic (SSURGO) database**

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**Abstract**

Agroecosystem process models are excellent tools for predicting biogeochemical cycling in high production areas like Iowa. Agroecosystem models inform on-farm management decision makers on methods that optimize production while maintaining soil quality and mitigating environmental risk. The inherent problem with these models is that they are sensitive to soils input data. This study investigates the impact of different soils input data, i.e., the Soil Survey Geographic (SSURGO) database and site-specific digital soil maps (DSM), on model simulations predicting Maize aboveground biomass and yield. The study was carried out at the Sustainable Advanced Bioeconomy Research (SABR) farm, a 28-hectare field located near Ames, IA, on soils that are part of the Clarion-Nicollet-Webster soil association. Maize simulations of biomass and yield were predicted with the Agricultural Production Systems sIMulator (APSIM) for the growing season of 2018. Twenty-one different SSURGO synthetic soil profiles were used as model inputs based on various combinations of spatial and tabular data. For DSM, 2030 synthetic profiles were used as model inputs, which corresponded to the number of raster grid cells in the field. The maximum biomass and yield for SSURGO inputs ranged from 2100-2577 g m-2 and 184-248 bu ac-1, respectively. The maximum biomass and yield for DSM inputs ranged from 1826-2262 g m-2 and 156-209 bu ac-1, respectively. The DSM inputs produced substantially lower average maximum biomass and yield compared to SSURGO for the field (-194 g m-2, -30.7 bu ac-1). This is alarming considering APSIM is frequently used to make regional agroecosystem predictions for the Midwest solely using SSURGO data. These results justify expanding the study to include independent validation of the simulations with field data. Furthermore, a sensitivity analysis should be performed to determine which soil properties have the greatest influence on simulation accuracy.