

464c Monte Carlo Coupled with Life Cycle Analysis to Portray the Environmental Impacts of US Agriculture

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Life cycle analysis is coupled with Monte Carlo analysis to investigate the environmental impacts associated with the US agricultural corn-soybeans system. The inherent variability in agricultural systems can be difficult to capture in life cycle assessments, which often require the use of only one value to represent inputs and export factors to the system. The upstream and on-farm flows of nutrients and energy were modeled for the US Corn Belt. Through the use of Monte Carlo simulations, the life cycle inventory incorporates both natural variability (i.e. the differences in nutrient exports from a wet year to a drought) and data uncertainty. Uncertainty in the impact assessment phase is combined with LCI estimates to portray the range of probable environmental impacts from corn-soybean agriculture within the US.