



Effects of tillage practices on net farm profits

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Various tillage practices are some of the most widespread, costly, and important inputs for agricultural systems as well as some of the most promising for managing soil organic carbon (SOC) storage in croplands. While many studies have looked at effects of these agricultural practices on SOC and economic profits, a comprehensive understanding of how these effects vary across climate and soil variables is lacking. Such understanding would be imperative for achieving greater carbon sequestration in agricultural lands without negatively affecting food production or farmer livelihoods.

We assessed how differences in farm profits resulting from different tillage practices vary with climate and soil factors. No-till and reduced tillage often resulted in smaller profits to the farm than conventional tillage, though not always. The difference between no-till and conventional tillage were more positive in more humid climates than in drier climates and in coarser-textured soils. Switching to no-till on certain crop types, such as continuous cereals was more costly than other crops. We combine our meta-analysis on net farm returns with similar efforts on SOC sequestration to identify areas that give the greatest carbon sequestration for the cost of shifting agricultural practices.