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# **Land use change rapidly degrades soil properties**

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*Remnant prairie (ca 1885) before (top), during (middle), and after (bottom) cultivation during spring 2013. Photos by Photo by David Tollefson and Jeffrey Strock.*

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Soil carbon plays a vital role in climate regulation, nutrient availability, and food and fiber production. Under current cultivated row-crop agriculture, it will be difficult, if not impossible, to restore soil carbon and soil function to pre-cultivation characteristics and performance. Management strategies that support sustainable and resilient agricultural production systems are needed to ensure food and environmental security.

In a recent *Agronomy Journal* article, researchers in Minnesota examined how converting remnant prairie (ca. 1885) to cultivated cropland affected soil properties. The team found that conversion disrupted the system's dynamic equilibrium as evidenced by rapid changes in the soil's physical, hydraulic, and chemical properties.

Quantitatively, the research demonstrated that, after only two years, cultivation significantly degraded soil carbon and impeded soil infiltration. This result has important implications for understanding soil organic carbon destabilization and loss and highlights how quickly and dramatically soil properties can change.

### **Dig deeper**

Strock, J.S., Johnson, J.M., Tollefson, D., & Ranaivoson, A. (2022). Rapid change in soil properties after converting grasslands to crop production. *Agronomy Journal*.

<https://doi.org/10.1002/agj2.21045> (in press)

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