

CARBON IMPACT OF CONSERVATION PRACTICES: NO-TILL

No-till systems involve minimal soil disturbance and maintain crop residues through most of the year. The only soil disturbance is done in-row during planting. Leaving the soil as undisturbed as possible leads to healthier soil and crops.^{1,2}

Benefits of no-till farming^{3,4,5,6}



Improves soil structure



Decreases weed pressure



Allows soil to better sequester carbon



Prevents soil crusting



Reduces wind and water erosion



Improves nutrient management



Helps soil retain and store water



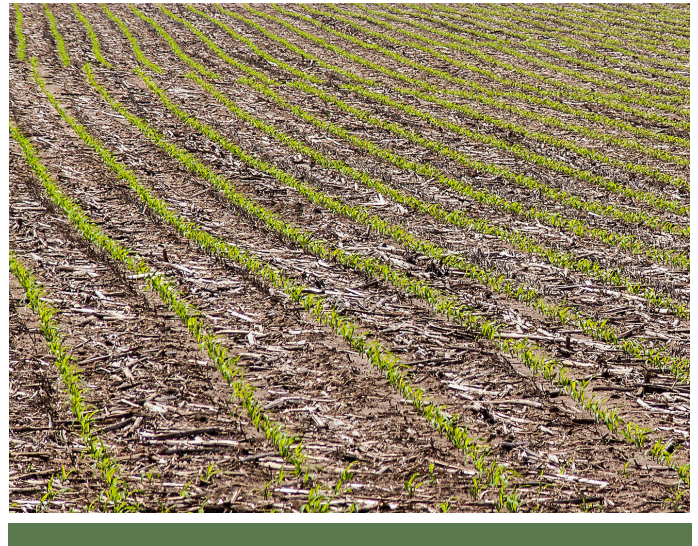
Helps soil retain organic matter



Preserves healthy soil organisms



Creates healthier soil



IMPACTS OF TILLAGE

Tilling a field requires heavy equipment to make several passes to break up the topsoil. This process creates a compact lower layer of soil that is harder for roots and water to penetrate, and a loose top layer that is susceptible to wind and water erosion. The turning of soil also brings weed seeds to the surface, increasing, rather than decreasing, weed growth. Tilling also removes protective vegetation, which leads to the crusting of topsoil. This crusting reduces the amount of oxygen in the soil, makes water absorption more difficult, negatively impacts seed germination, and further increases erosion and makes it more susceptible to drought during dry seasons.^{7,8,9}

Sources

1 Bergman, Kayla. "Conservation Practice Impact on Carbon Sequestration." Center for Rural Affairs, March 2022, cfra.org/publications/conservation-practice-impact-carbon-sequestration. Accessed April 2022.

2 "Informational Sheet: Soil Health & Conservation." Center for Rural Affairs, 2021, cfra.org/publications/information-sheet-soil-health-conservation. Accessed March 2022.

3 Bergman, Kayla. "Conservation Practice Impact on Carbon Sequestration." Center for Rural Affairs, March 2022, cfra.org/publications/conservation-practice-impact-carbon-sequestration. Accessed April 2022.

4 "Informational Sheet: Soil Health & Conservation." Center for Rural Affairs, 2021, cfra.org/publications/information-sheet-soil-health-conservation. Accessed March 2022.

5 Via, Sara. "Increasing Soil Health and Sequestering Carbon in Agricultural Soil: A Natural Climate Solution." Izaak Walton League of America and National Wildlife Federation, 2021, iwla.org/soil_report. Accessed March 2022.

6 "Soil Quality Indicators: Soil Crusts." U.S. Department of Agriculture, Natural Resources Conservation Service, June 2008, [nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_053281.pdf](https://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_053281.pdf). Accessed March 2022.

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THE IMPORTANCE OF CARBON SEQUESTRATION

Tilling releases carbon that is naturally stored in the soil, making it more difficult for it to be retained in the future. In addition, by reducing soil disturbances, the soil is better able to sequester additional carbon.¹⁰

CREATING HEALTHIER SOIL

By reducing disturbances, the soil can retain its organic matter, nutrients, oxygen, and carbon, leading to healthier soil. It is better able to absorb and retain water and maintain its structure. This reduces erosion and prevents crusting of topsoil.^{11,12,13}

METHODS FOR NO-TILL SYSTEMS

No-till systems do require specialized equipment, but they use less labor and fuel. Rather than making multiple passes to till the soil, no-till requires minimal passes to plant and cover. Using no-till devices, such as a furrow closer, allows for rows to be planted and closed in one pass. This keeps the majority of soil undisturbed and reduces soil compaction.^{14,15}

SUPPORT FOR MAKING THE CHANGE

The U.S. Department of Agriculture (USDA) supports farmers implementing no-till systems in several ways. Some USDA Service Centers have no-till equipment available to rent for minimal fees. The USDA Natural Resources Conservation Service (NRCS) supports no-till systems through programs such as the Conservation Stewardship Program (CSP) and the Environmental Quality Incentives Program (EQIP). These programs provide producers with both technical and financial assistance to start new no-till plans. To learn about potential equipment rentals, find local [USDA Service Centers](#). To learn more about CSP and EQIP, visit your local NRCS service center, which you can find at [offices.sc.egov.usda.gov/locator/app](https://sc.egov.usda.gov/locator/app).

Sources

10 Bergman, Kayla. "Conservation Practice Impact on Carbon Sequestration." Center for Rural Affairs, March 2022, cfra.org/publications/conservation-practice-impact-carbon-sequestration. Accessed April 2022.

11 Ibid.

12 Via, Sara. "Increasing Soil Health and Sequestering Carbon in Agricultural Soil: A Natural Climate Solution." Izaak Walton League of America and National Wildlife Federation, 2021, iwla.org/soil_report. Accessed March 2022.

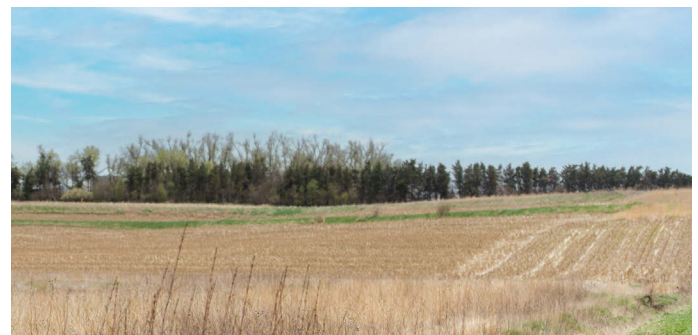
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CARBON SEQUESTRATION

No-till systems help preserve healthy microbes in the soil and make nutrients more available to crops.¹⁶



Switching from conventional tillage to no-till can sequester up to 0.42 metric tons of carbon dioxide per acre per year, and up to 0.73 metric tons of carbon dioxide equivalent per acre per year.¹⁷



14 Bergman, Kayla. "Conservation Practice Impact on Carbon Sequestration." Center for Rural Affairs, March 2022, cfra.org/publications/conservation-practice-impact-carbon-sequestration. Accessed April 2022.

15 Creech, Elizabeth. "Park Your Plow: 5 Tips for the No-Till-Curious." U.S. Department of Agriculture, Natural Resources Conservation Service, Nov. 5, 2018, farmers.gov/blog/park-your-plow-5-tips-for-the-no-till-curious. Accessed March 2022.

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