

A Closer Look At

Conservation Tillage

While tillage has been a popular practice in the Midwest for decades, many producers are turning their attention to conservation tillage methods given the benefits to both their operations and the environment.



What is conservation tillage?

Conservation tillage methods manage the amount and distribution of crop and plant residue on the surface of a field throughout the year. Limiting soil-disturbing activities has a multitude of benefits for soil health.¹

The downside of tillage

Tilling a field—particularly for years at a time—can have a negative effect on soil structure and health. The process creates a loose layer of topsoil that is susceptible to wind and water erosion while simultaneously compacting lower layers of soil, making it difficult for roots and water to penetrate. The turning of soil also brings weed seeds to the surface, increasing growth. Additionally, tilling 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 increases erosion and susceptibility to drought.²

Conservation tillage methods

No-till: No-till systems involve minimal soil disturbance and maintain crop residue on the soil surface for most of the year—the only soil disturbance is done in-row during planting. While no-till systems require specialized equipment, they use less labor and fuel because of the reduced number of passes across a field.³

While this option works well for many producers, some may begin to implement conservation tillage through reduced tillage methods.

Strip-till: Popular in grain and vegetable systems, strip-till involves shallow tilling of narrow strips using specialized equipment, providing areas for seeds to be planted. The remaining areas in the field are left undisturbed.

Mulch-till: This method includes precisely timed tilling of the entire field and leaving 30% of plant residue, which is coarsely tilled into the top of the soil to increase soil organic matter.

Sources

1 “Conservation Practice Standard Overview, Residue and Tillage Management, No Till (Code 329).” U.S. Department of Agriculture, September 2016, nrcs.usda.gov/sites/default/files/2022-09/Residue_And_Tillage_Management_No_Till_329_PO_Sep_2016_0.pdf. Accessed January 2024.

2 “Carbon Impact of Conservation Practices: No-Till.” Center for Rural Affairs, Oct. 26, 2022, cfra.org/publications/fact-sheet-carbon-impact-conservation-practices-no-till. Accessed January 2024.

3 Ibid.



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Ridge-till: Popular with row crops, this method involves creating mounds and furrows. Crops are then planted on the mounds, and weeds are managed in the furrows through tilling during the growing season. Plant residues are left and tilled back into the soil the following season.

Vertical tillage: This method requires specific machinery that cuts vertically into the field, interspersing crop residue into the top portion of the soil. Proper vertical tillage leaves 60% to 80% of crop residue on the soil. This method aims to reduce soil disturbance compared to conventional tilling and incorporate crop residue into the soil to help facilitate its breakdown.⁴

Benefits of conservation tillage systems

Every operation is different. While one producer may opt in to conservation tillage to address erosion concerns, another may be invested in retaining moisture during periods of drought. Regardless of motivation, no-till and reduced tillage systems have the potential to benefit farms in multiple ways.

- Decreases weed pressure
- Helps soil retain organic matter
- Helps soil retain water
- Improves carbon sequestration
- Improves nutrient management
- Improves soil health
- Improves soil structure
- Preserves healthy soil organisms
- Prevents soil crusting
- Reduces erosion
- Reduces labor and fuel costs



Watch a video about no-till at rb.gy/uzrqoq.

How to get started

The U.S. Department of Agriculture’s Natural Resources Conservation Service supports conservation tillage through programs such as the Conservation Stewardship Program and the Environmental Quality Incentives Program, which provide producers with technical and financial assistance. In addition, some U.S. Department of Agriculture Service Centers have no-till equipment available to rent for minimal fees. To find your local office, visit offices.sc.egov.usda.gov/locator/app.

Sources

4 “Carbon Impact of Conservation Practices: Reduced Tillage.” Center for Rural Affairs, Oct. 26, 2022, cfra.org/publications/carbon-impact-conservation-practices-reduced-tillage. Accessed January 2024.



This material is based on work supported by the National Fish and Wildlife Foundation, General Mills, and the U.S. Department of Agriculture under agreement number 2004.23.077344. The views and conclusions contained in this document are those of the author(s) and should not be interpreted as representing the opinions or policies of the U.S. Government or the National Fish and Wildlife Foundation and its funding sources. Mention of trade names or commercial products does not constitute their endorsement by the U.S. Government or the National Fish and Wildlife Foundation or its funding sources. U.S. Department of Agriculture and the National Fish and Wildlife Foundation are equal opportunity providers and employers.



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