Tillage in 2001: No-till

Mahdi Al-Kaisi  
*Iowa State University*, malkaisi@iastate.edu

H. Mark Hanna  
*Iowa State University*, hmhanna@iastate.edu

Michael J. Tidman  
*Iowa State University*

Follow this and additional works at: [http://lib.dr.iastate.edu/cropnews](http://lib.dr.iastate.edu/cropnews)

Part of the [Agricultural Science Commons](https://agriculturalsciencecommons.org), [Agriculture Commons](https://agriculturecommons.org), [Agronomy and Crop Sciences Commons](https://agronomicysciencescommons.org), and the [Bioresource and Agricultural Engineering Commons](https://bioresourcecommons.org)

The Iowa State University Digital Repository provides access to Integrated Crop Management News for historical purposes only. Users are hereby notified that the content may be inaccurate, out of date, incomplete and/or may not meet the needs and requirements of the user. Users should make their own assessment of the information and whether it is suitable for their intended purpose. For current information on integrated crop management from Iowa State University Extension and Outreach, please visit [https://crops.extension.iastate.edu/](https://crops.extension.iastate.edu/).
Tillage in 2001: No-till

Abstract
This article discusses the no-till conservation system and is the final article in a series on tillage options (see August 21 ICM article on strip-tillage and the August 7 issue on ridge-tillage) that Iowa producers may consider in making tillage practice and management plans for the 2001 crop year.

Keywords
Agronomy, Agricultural and Biosystems Engineering

Disciplines
Agricultural Science | Agriculture | Agronomy and Crop Sciences | Bioresource and Agricultural Engineering
Tillage in 2001: No-till

This article discusses the no-till conservation system and is the final article in a series on tillage options (see August 21 ICM article [1] on strip-tillage and the August 7 issue [2] on ridge-tillage) that Iowa producers may consider in making tillage practice and management plans for the 2001 crop year.

No-till is a tillage system where no disturbance of the soil occurs prior to planting, except for the injection of liquid manure or anhydrous ammonia. In addition, all the residue from the previous crop remains on the soil's surface to protect it from erosion. No-till often is used to achieve soil conservation requirements on highly erodible land, but it is becoming a more popular management practice among Iowa producers for the advantages it offers, and because of emerging technologies that address its limitations.

No-till advantages

Many producers find that no-till crop production systems help them save time, conserve moisture, and reduce erosion. And depending on your current tillage system, eliminating tillage passes by converting to no-till could offer a significant cost savings on labor, fuel, and other machinery operating costs. You should also consider the impact of reduced insurance, interest, and depreciation costs resulting from converting to a no-till system.

No-till may have an impact on your bottom line in terms of timely planting. Because with no-till you are in and out of the field faster, you can cover more acres and finish within narrow planting windows that offer optimum yield potential.

No-till disadvantages

Three potential disadvantages of no-till are as follows. First, using burndown herbicides instead of tillage to eliminate competition from early-season weeds is relatively expensive, raising production costs. Second, the crop residue left on the soil in no-till systems hinders soil warming and drying, making planting more difficult and germination conditions less than ideal. Third, no-till poses
many new management challenges for the new no-till producer. For example, in no-till soybean an increase in residue on soil surface leads to an increase in soil moisture that in turn increases the potential for soybean root diseases.

**Planning and implementing no-till**

Implementing no-till means crop residue should be spread as evenly as possible during harvest, with the soil to be disturbed only for injection of anhydrous ammonia, manure, or planting. No-till planters must establish good seed-to-soil contact, without the advantage of tillage, for the seeds to germinate properly. Opening the row for the seedbed requires a row opener on the planter that is capable of slicing through soil and a variety of crop residue. If you choose to go no-till, you may need to adjust your current equipment and add heavier down-pressure springs and row cleaners or a coulter on each planter row unit.

Be aware that changing from a conventional tillage system to no-till changes the characteristics and behavior of your soil. No-till promotes the formation and enhancement of more stable soil aggregates (small clumps of soil particles that adhere to each other), resulting in more space or larger pores between the aggregates. Increased aggregation of the soil reduces crusting and enhances infiltration of air and water into a more porous soil.

The best location for plant nutrients is below the soil surface, where the plants' root systems can access them. But because incorporating fertilizer (and pesticides) buries residue and disturbs soil structure, no-till systems require broadcast applications, with occasional exceptions made for the injection of nitrogen or manure. No-till also requires producers to monitor fertility in the top 2 inches of the soil as well as to a depth of 6 to 8 inches.

Controlling weeds in no-till relies on close management and timing of herbicide applications and encouraging crop competition. Timing weed control with emergence is critical in controlling weeds in a no-till system, and may require multiple spraying passes. Weed species present in no-till may be somewhat different than those present with full-width tillage, thus some change in weed management strategies may be needed.

**Conclusions**

Converting to any conservation tillage plan requires learning and adopting new farming techniques, operating specialized equipment, and possibly handling weed control products differently.

It also requires understanding that reported yield reductions are not necessarily caused by the conservation tillage system, but rather by not finding the correct response to the challenges of a new tillage system. Growers are encouraged to evaluate strengths and weaknesses of each tillage system in comparison to their soil types and management styles. Although systems with little or no tillage before planting may require different management, one reward is
spending less time per acre in the field.

**Conservation Tillage Publications**

AE 3049 Conservation Tillage -- Planning  
AE 3050 Conservation Tillage -- Effects on Soil Erosion  
AE 3051 Conservation Tillage -- Effects on Water Quality  
AE 3052 Conservation Tillage -- No-Till Systems  
AE 3053 Conservation Tillage -- Ridge-Till Systems  
AE 3054 Conservation Tillage -- Fertility Practices and Equipment  
AE 3056 Conservation Tillage -- Planters for No-Till  
AE 3057 Conservation Tillage -- Planters for Ridge-Till

A single copy of each of these Iowa State University Extension publications is available free from the Iowa State University Extension Distribution Center. Call 515-294-5247 or e-mail pubdist@iastate.edu.

This article originally appeared on page 172 of the IC-484(22) -- September 18, 2000 issue.

**Source URL:**  

**Links:**  