Hold Off on Tillage This Fall, Keep Soil Covered

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Hold Off on Tillage This Fall, Keep Soil Covered

Abstract
This is the time of the year when tillage becomes the number one priority for some, whether they need it or not. The question to ask is, “Do I need to till this fall?” Given the economic and environmental challenges farmers are facing, the answer in most cases is no. With the end of the growing season here and harvest under way, now is a good time to start thinking about this decision. Take into consideration your site-specific condition and whether tillage makes economic and environmental sense given the input costs associated with tillage operations as well as the impact on soil and water quality. Even though tillage may be needed in certain situations and field conditions, a well-managed field and proper crop rotation may not call for tillage.

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This is the time of the year when tillage becomes the number one priority for some, whether they need it or not. The question to ask is, “Do I need to till this fall?” Given the economic and environmental challenges farmers are facing, the answer in most cases is no. With the end of the growing season here and harvest under way, now is a good time to start thinking about this decision. Take into consideration your site-specific condition and whether tillage makes economic and environmental sense given the input costs associated with tillage operations as well as the impact on soil and water quality. Even though tillage may be needed in certain situations and field conditions, a well-managed field and proper crop rotation may not call for tillage.
Two main considerations for making any tillage decisions:

1. Soil conditions: natural drainage, top soil depth, soil slope, organic matter, and soil texture need to be considered. These factors can have a significant effect on how successful the tillage system (no-till or conventional tillage system) is and how tillage can effect soil quality, productivity, and water quality negatively.

2. Management considerations: These include residue management, crop rotation, equipment availability and efficiency (proper setting of planter for different tillage systems, calibration of combine to ensure uniform residue distribution, etc.), drain tiles for managing excess soil water, soil test and fertilizer management, suitable hybrid for your area in the state, and insect and disease control. These management decisions are equally important to determine the success level of your crop production.

Tillage decision must be considered carefully to minimize negative effects on soil quality and productivity. There are alternatives that are equally effective as conventional tillage. Site specific conditions, soil and water quality considerations and the economics of tillage must be included in the decision of conducting tillage or not.

Photo 1. Soil erosion with conventional tillage.

Over the past 10 years, long-term tillage studies were conducted with five tillage systems and three crop rotations across Iowa. The studies document the most effective tillage and crop rotation combination for each region. Results showed a wide range of yield responses in corn and soybean for different regions which reflect various soil and climate conditions across the state. The research shows that soybean yields after corn showed no significant difference between tillage systems. Soybean in no-till performed as good or better than conventional tillage systems.

The choice of tillage for corn is more complex; careful consideration should be given to the soil’s long-term health and productivity as decisions are made. Research
demonstrated that no-till and strip-tillage is as competitive as any conventional tillage system in well-drained soils and where field drain tiles are available to remove excess water in north and north-central Iowa due to conditions of poorly-drained soils with corn after soybean (C-S) or continuous corn (C-C) rotation.

Photo 2. No-till field after corn harvest.

Conservation tillage systems such as no-till have a positive impact on soil quality, soil productivity, and profitability under extreme weather events of wet or dry conditions. These systems protect soil, conserve energy, improve soil health and organic matter, and reduce input costs associated with tillage operations in conventional tillage.

In agricultural row cropping systems, significant stress is exerted on soil functions through management practices such as soil tillage, chemical application, and monocropping systems. Conservation practices, including no-till and extended crop rotations can mitigate the negative effects on soil health and productivity. A no-tillage system can restore soil health over time by improving soil infiltration, organic matter, microbial diversity, and soil structure. The extended crop rotations that include small grains, legumes, and cover crops will equally increase soil biodiversity, protect the soil surface physically during the off season, and provide organic carbon input.

There may be some challenges in managing corn residue, but tillage is not the answer. Simple modification of the planter to include residue cleaners, heavier down-pressure springs, or other residue management attachments are far more cost effective given the environmental cost and economic expense associated with conventional tillage.

The extended period of time, when soil has no living cover or residue cover for approximately seven months, presents a major environmental challenge that needs to be factored in when deciding on a tillage practice for this fall. Tillage can contribute to the acceleration of soil and nutrients loss given the uncertainty of climate events and their variability, as demonstrated yearly, from extreme drought in 2012 to early wet season
which is experienced annually.

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**Category:** Crop Production, Soils

**Crops:** Corn, Soybean

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