Why use a conservation tillage system?

Profit.

■Yields are as good, if not better, than reduced or intensive tillage systems when attention is paid to management details.

■Optimizes soil moisture. Improved infiltration and increased organic matter are especially important on droughty soils and may help the crop through a persistent dry period. Tillage reduces available moisture by about 1/2" per trip.

■Saves time. On a 1000 acre farm an additional 100 hours are needed for every pass (example based on 18' disk, 160 Hp FWD). Many growers take advantage of the time savings by exploring other "opportunities."

■Reduces fuel consumption. In fact, no-till can reduce fuel use by 3.5 gallons/acre compared to intensive tillage.

■Reduces machinery wear. Less machinery means fewer pieces need to be replaced. Economist report this amounts to a $5/acre reduction in costs.

Environment.

■Reduces soil erosion. This is an obvious benefit of conservation tillage. In fact, a 90% erosion reduction can be expected when using a no-till instead of intensive tillage system.

■Increases organic matter. Each tillage trip oxidizes some organic matter. Research shows continuous no-till can increase organic matter in the top 2 inches of soil about 0.1% each year.

■Improves water quality. When combined with crop nutrient management, weed and pest management (IPM) and conservation buffers, conservation tillage plays an important role in improving both runoff to streams, rivers and lakes as well as water that finds its way into aquifers.

■Wildlife. Conservation tillage improves habitat. The crop's residue provides food and shelter. And, if combined with other needed habitat (grassy cover and woody areas), wildlife may increase significantly.

Conservation planning with the Core 4 approach.

As each year passes, we improve our understanding of how to manage for better soil, cleaner water, greater profits and a brighter future. We call this management approach the Core 4. The four fundamental components integrated into this approach are: Conservation Tillage; Crop Nutrient Management; Weed and Pest Management (IPM); and Conservation Buffers. If you'd like to learn more about the Core 4 approach, call your local agronomic and/or natural resources professional:

- Agricultural Retailer
- Certified Crop Advisor
- Conservation District
- Extension Agent
- Independent Crop Consultant
- Natural Resources Conservation Service

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What's Conservation Tillage?

Conservation Tillage includes no-till, strip-till and mulch till systems. It saves time, reduces fuel, conserves soil, improves water quality, encourages wildlife and ultimately, increases profit.

Conservation Tillage

What's a conservation tillage system?

It's any system that leaves about a third of the soil covered after planting. This includes no-till/strip-till, ridge-till and mulch-till.

No-till/strip-till. No-till means leaving the residue from last year's crop undisturbed until planting. Strip-till means no more than a third of the row width is disturbed with a coulter, residue manager or specialized shank that creates a strip. If shanks are used, nutrients may be injected at the same time.

Ridge-till. 4-6" high ridges are formed at cultivation. Planters using specialized attachments scrape off the top two inches of the ridge before placing the seed in the ground.

Mulch-till. This full-width tillage system usually includes only one or two tillage passes. Yet, after planting, at least a third of the surface remains covered with residue.

Reduced-till and intensive-till. Full-width tillage systems like these are *NOT* considered conservation tillage. After planting, field residue covers less than a third of the soil.

Conservation tillage system management.

Managing a conservation tillage system is an important part of the overall farm management strategy. It includes planning crop rotation; analyzing soil conditions; keeping tabs on soil temperature and moisture; adjusting nutrient and weed management approaches; and selecting the equipment and attachments to match your farming system.

Crop rotation.

The previous crop will, in many ways, dictate the amount of tillage (if any) that can be done and still leave around a third of the soil's surface covered with crop residue.

Corn, wheat and sorghum produce high levels of residue after harvest. Thus, you can either plant directly into these residues (no-till/strip-till) or use one or two low-disturbance tillage passes (mulch-till) and still leave approximately a third of the soil covered.

Soybeans and cotton produce much less crop residue. Thus just one tillable pass may not leave enough cover after planting.

Soil condition.

While compaction, drainage and low fertility levels are important to correct in any tillage system, they are especially important to correct *prior* to the adoption of a conservation tillage system. Improved soil structure and higher organic matter levels may reduce the necessity to repeat these corrective measures.

Equipment selection and adjustment.

To assure good seed-to-soil contact when planting, equipment must be selected and adjusted to match your system, soils, yields and size. For instance, your combine needs to have a chaf spreader so the crop's residue is evenly spread across the full width of the combine. If your equipment is extremely old, you'll need to modify and strengthen it to handle high residue and more strenuous field conditions. In some regions residue managers, coulters and other planter attachments may be needed. Special equipment–like strip-till equipment–may be needed for sensitive crops (corn and cotton) in climates where moisture keeps soil cool at planting time. Row width will also need to be analyzed.

Weed control.

Weed control strategies may need to be modified. While weed pressure often seems to increase the first few years, over time weed pressure may decrease. A different array of weeds may prefer different tillage systems. For instance, weed species commonly found in intensive tillage systems often differ from those commonly found in a no-till system.

Nutrient management.

Your approach to nutrient management will also change to optimize production in a conservation tillage system. For instance, crops that require nitrogen to be added to the soil usually do best if your nutrient management program includes a starter fertilizer applied with the planter.

Bottom line.

If you properly manage these factors–crop rotation, soil conditions, equipment selection and adjustments, plant nutrients and weed control–conservation tillage will help improve your bottom line. It's also a critical step in maintaining–and even improving–soil productivity.

Best of all, conservation tillage helps keep topsoil, nutrients (particularly phosphorus) and crop protection products on your fields and out of creeks, streams and lakes.

In fact, scientific evidence indicates approximately 80% of environmental issues that result from cropland can be corrected by integrating conservation tillage, conservation buffers, nutrient management and weed and pest management (IPM) systems into your farm management approach.