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Tillage in 2002 - consider the options

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Abstract
Producers can consider several conservation tillage options for the 2002 crop year: ridge tillage, fall strip tillage, and no till. Each tillage practice has advantages and disadvantages, equipment investments, and site-specific suitability, and requires producers to learn how to implement and manage the practice.

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Hit the conservation tillage target

Research suggests that effective conservation tillage leaves at least 30 percent crop residue on the soil surface after planting. Managing soil type, slope, and crop rotation and using field operations (such as knifing in nitrogen or manure) while still leaving 30 percent crop residue (especially after soybean) require careful planning. The timing of tillage (fall versus spring) can have considerable impact on amount of effective residue cover after planting. Below are suggestions for hitting the 30 percent target for tillage options.

Ridge tillage

Crops are planted on exposed ridges 4 to 6 inches above the surface of the surrounding field. The ridged, dark soil warms and dries more quickly than the surrounding soil, which improves germination and crop growth. The results are faster crop canopy development and yield improvement.

Advantages. Ridge tillage improves soil infiltration, conserves moisture, and reduces runoff and evaporation. It is an effective soil moisture conservation system in areas where rainfall shortages exist. Fertilizers and chemicals can be applied in the dry zone (the shoulder of the ridge).

Disadvantages. Ridge tillage requires special equipment (ridge cultivator, ridge planter) and precise wheel spacing. Ridge till also requires two cultivation passes, making it time-consuming and labor-intensive (the size of some operations may limit use). Weed and fertility management is a challenge, and depends on timely cultivation and effectiveness of banded herbicides. If ridges aren't already built, fall cultivating will be necessary so ridges settle before spring planting.

No till

No till leaves the soil undisturbed year around. The only "tillage" is the soil disturbance in a narrow slot created by coulters to prepare a seedbed. Some producers modify no till by

injecting manure or ammonia with knives or a rotary hoe.

Advantages. No-till can substantially improve soil infiltration, compaction, and carbon and nutrient cycling. Savings on labor, fuel, and other operating costs occur because tillage trips are eliminated. The greatest economic benefits may result from increased timeliness. No till often facilitates faster planting, so that more acres are covered within optimum planting windows.

Disadvantages. Iowa producers who used no till in the past noticed slightly lower yields, especially with corn, compared with other tillage systems, mainly on high organic matter and poorly drained soils. Slow germination due to cool soil and wet seedbeds were to blame. No till limits incorporation of chemicals. In no till soybean, increased residue translates into higher soil moisture levels, which increase the potential for root diseases.

Fall strip tillage

In fall strip tillage, the soil is tilled in 6- to 8-inch wide strips by using modified anhydrous ammonia applicator knives, roto-tillers, in-row chisels, row cleaners, cultivator sweeps, and double discs. With anhydrous ammonia applicator knives, consider moving the knife positions out of the wheel track area, so planting does not occur in a wheel track. The tillage zone provides relative positions for seeds, fertilizers, and anhydrous ammonia.

Advantages. Fall strip tillage solves some of the disadvantages of no till (high residue cover, poorly drained soils, early planting, and uneven planting surfaces). It also minimizes soil moisture loss, reduces soil erosion (only one-third of the soil surface is disturbed), and preserves most crop residue on the soil surface.

Disadvantages. Some soils remain wet under heavy residue, and tillage tools used to prepare a strip for seed placement may compact wet soil and form clods when the soil dries. Wet soil also tends to cling to depth gauge wheels on planters, inhibiting uniform seed depth. For producers who plant in cover crops or sod, rolling strip tillage attachments may not effectively penetrate root masses. Over winter, residues removed in the strip till pass can be blown over the strip tillage area, suppressing warming and drying. Planter width must match the width of strip tillage equipment.

Why change tillage systems?

Soil erosion and surface runoff contribute to water quality problems. Although converting to a conservation tillage practice requires learning and adopting new farming techniques, at times operating specialized equipment, and possibly handling different products, many producers find that conservation tillage systems reduce fuel costs, save time, and conserve moisture while reducing erosion.

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