Illinois Erosion & Tillage Trends

Two Tillage Milestones

2006 was a milestone year in Illinois. For the first time, more acres in Illinois were planted with no-till than with conventional tillage. According to the 11th Erosion and Tillage Survey, 33.1 percent of all cropland in Illinois (corn, soybeans, and small grain) was planted with no-till, in which the soil is left undisturbed from harvest through planting. Conventional tillage, in which a significant portion of the crop residue is buried, now trails at 31.2 percent of the land surveyed (see Figure 1).

In other words, conventional tillage isn’t so conventional any longer.

Figure 1
Illinois Tillage Trends for all Crops—Corn, Soybeans, Small Grains

- Conventional
- Reduced-till
- Mulch-till
- No-till

- Conventional: Less than 15% residue
- Reduced-till: 15 to 30% residue
- Mulch-till: Some tillage, but at least 30% residue
- No-till: Residue left undisturbed, harvest to planting
No-till has come a long way since the 1970s and 80s, when the system was just catching on and many people called it a passing fad. Even as recently as 1994, when the state’s tillage survey was first conducted, conventional tillage was as high as 46.1 percent, with no-till far behind at 22.7 percent.

Another 2006 milestone was that for the first time the amount of Illinois bean land planted in no-till has topped the 50-percent mark, reaching 51 percent (see Figure 2). Both milestones only solidify Illinois’ reputation as the no-till capital of the country. The state leads the nation in total no-till acres, and George McKibben, a University of Illinois agronomist, is regarded as the father of no-till.

The Erosion and Tillage Survey is conducted every two years by the Illinois Department of Agriculture and the state’s 98 soil and water conservation districts. Information on tillage systems and crop residue was gathered at more than 50,000 points across the state.

Although data have been collected on tillage since 1982, the transect survey method currently being used was not started until 1994.

What About No-Till Corn?

No-till corn lags well behind no-till soybeans. But it’s on the rise after suffering a setback in 2004. In the 2006 survey, no-till corn acreage in Illinois reached 16.7 percent, an increase of almost 2 percentage points since 2004 (see Figure 3).

Strip-till, a form of no-till that is catching the attention of producers across the state, may be partially responsible for the increase in no-till corn. Strip-till solves the major stumbling block to no-till corn—the cool, wet conditions in the spring, which can stunt the crop’s early-season growth and development. Heavy crop residue makes for a cooler, wetter seedbed, and this poses a problem for corn, which is planted much earlier than soybeans.

Strip-till, in contrast, preserves all of the crop residue, except for a narrow strip in which the seed is planted. Mounds are created in this narrow strip during fertilizer application in the fall, creating a warmer, drier seedbed.
Erosion Trends

Erosion rates continue to hold steady. The 2006 survey showed that 85.8 percent of the land was kept within tolerable erosion levels, a dramatic improvement over the 76.2 percent figure of 1996. However, since 1997 the percentage of land with tolerable erosion rates has remained virtually unchanged (see Figure 4).

The ultimate goal is to bring soil erosion on as much farmland as possible below tolerable levels, also known as “T levels.” When erosion is kept at or below T, that means soil is being replenished as quickly as it is being lost. For most soil types, tolerable soil loss is between 3 and 5 tons per acre per year.

With nearly 86 percent of the land at or below T, that means 14 percent still exceeds tolerable soil loss levels. The good news is that the majority of this remaining land could be brought in line with only slight adjustments in management systems to retain more crop residue.

Roughly 10 percent of Illinois cropland exceeds tolerable erosion rates by only 1 to 3 tons of eroded soil per acre annually. So if this land were brought in line, the total amount of Illinois land with acceptable erosion rates would jump to an impressive 96 percent.

The remaining 4 percent will be much tougher to tackle because this land has erosion rates more than twice the tolerable level.

What About Gully Erosion?

Ironically, as overall erosion rates have steadily declined over the years, gully erosion has not (see Figure 5). Gully erosion is the kind of erosion that digs wide ruts in the land—in contrast to sheet and rill erosion, which removes thin layers of soil and cuts tiny channels into the land.

The percentage of surveyed land that had gully erosion was 14 percent in 1995, but in 2006 that figure was 25 percent.

Controlling gully erosion typically requires structural conservation practices, such as grade-control structures and grassed waterways, in addition to tillage and other cultural erosion-control practices.
When soil erosion is kept below the “T level,” soil is being replenished as rapidly as it is being lost.

For most Illinois soils, the T level is 3 to 5 tons of soil lost annually.