

Historical Trends in Conservation Tillage

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In all of agriculture, few processes carry the emotional bond between the farmer and the earth, or possess the faith of a bountiful crop from the placement of a small seed into the soil. It's no wonder that breaking from a tradition of working the land or tilling the soil has required great resolve by the most committed conservation farmers to master the no-till system. Yet this seeding process holds the potential to not only produce this bountiful crop, but build health and restore life to our precious soil resource, while offering cleaner air and water to the neighbors and communities throughout the 'farmscape.'

Travel back to 1943 and trace some historical moments in the development of no-till cropping systems.

- In 1943, Edward Faulkner released findings in his book *Plowman's Folly*, which states: by not plowing under the crop residue and leaving more crop residues at the soil surface, farmers could improve soil quality and reduce soil erosion. At that time few researchers or agencies took the book seriously.
- In 1962, the agriculture experiment station in Wooster, OH planted their first no-till plots on erosive soils. These have been in continuous no-till since 1962. Throughout this study, soil organic carbon has continually risen, and water runoff and erosion have become practically nonexistent. Some pioneering farmers in Indiana quietly began some of their own trials about this time.
- In the 1970's, the Universal Soil Loss Equation (USLE) gave us a quantitative estimate of the soil erosion reduction potential for various conservation tillage practices. This, along with the Clean Water Act, helped to make conservation tillage a priority for the Soil Conservation Service (SCS); later renamed the Natural Resources Conservation Service (NRC). Purdue University began their tillage system studies in the mid 70's.
- The 1985 Farm Bill, for the first time, tied farm program payments to Highly Erodible Land Conservation, and reauthorization occurred with each subsequent farm bill. As a result of the thousands of conservation plans developed by SCS/NRCS under these farm bills, the most widespread implementation of conservation tillage on Indiana's cropland was launched.
- In 1989, Indiana's "T by 2000" program launched the Indiana Tillage Transect to track changes in conservation tillage adoption across the state. This model was soon adopted by most states across the Corn Belt.
- Nothing has had a greater effect on no-till soybean production than "Round-Up Ready" Soybeans, which first became commercially available in 1996. The benefits to the soil and water resources from this biotechnology development were of historic proportion. Over the span of just one decade, Indiana's no-till soybean acres increased from under 20% to over 60%.
- "BT Corn" was registered by the Environmental Protection Agency in 1997 and made the production of corn possible in many cropping systems without the use

of expensive and sometimes dangerous broad spectrum insecticides. “BT Corn” has an introduced gene that produces a compound that is toxic to target pests, such as corn borer and rootworm.

- By 2000, even with advanced technology, no-till corn in Indiana was still only 21% of total production. **An increase of no-till corn to just 30% of production would reduce soil loss by 2,688,000 tons in Indiana.**
- In 2002, Indiana NRCS founded the Indiana Conservation Tillage Initiative to expand the adoption of no-till and other high residue farming systems.
- In 2004, the Tillage Transect showed that 19% of the corn acres and 61% of the soybean acres were planted using no-till technology.
- In 2006, 26 of Indiana’s 92 counties participated in the annual Tillage Transect, supported by Indiana State Department of Agriculture, Division of Soil Conservation. Of the 26 counties, 22 had increases in no-till corn and 24 had increases in no-till soybeans from their 2004 results. No-till corn increased by more than 25% in 14 of the 26 counties, and four counties had over a 100% increase.
- In 2007, the Indiana Conservation Partnership once again committed resources to complete the Tillage Transect. Results are still being analyzed, but early indications suggest large-scale adoption of no-till systems.
- In 2007, the National Agricultural Air Quality Task Force met in Indiana. Some top conservation farmers from Indiana presented concepts and discussion on how the use of conservation systems, along with no-till crop production, is yielding major advances in air quality and greenhouse gas reductions for them and others across the American Heartland. These farmers publicly introduced terms like the following.

“2 X 4 No-Till,” from Ray McCormick of Vincennes: Ray suggests we use conservation innovation to answer the nation’s call to reduce the harmful emissions of greenhouse gasses and address the on-going concerns of global warming. McCormick stated, “Unlike previous generations, we have the technology, chemistry, and machinery of the 21st century to make no-till possible.”

“Bio-Till System,” from Dan DeSutter of Attica: Dan blends no-till, cover crops, manure application, and nutrient balancing to maximize the soil organisms that incorporate crop residues, nutrients, air, and water far more efficiently than any piece of iron could. With this biological approach, he has been able to improve soil, water, and air quality while achieving high yields and reduced soil erosion.

Is it possible that this is what Edward Faulkner had in mind in 1943?

The time is now to “capture the potential.”