Scientists Reflect On 25 Years Of No-Till Wheat Research

PRINCETON, KY.

No-till wheat research at the University of Kentucky College of Agriculture has come a long way since a drill dropped seeds in the first test plot more than 25 years ago at UK's Research and Education Center in Princeton.

In the fall of 1983, many producers and industry professionals widely viewed no-till wheat as a risky endeavor. Over the years, it has provided many benefits to growers and the environment and catapulted UK to a national leader in the field.

UK wheat scientists Lloyd Murdock and Jim Herbek have been in the UK College of Agriculture since the beginning.

"In the early 80s, farmers were planting no-till corn and soybeans but were still using conventional tilling methods for wheat," said Murdock, UK soil scientist. "It made sense to plant no-till wheat and make this a complete no-till system."

Some wheat producers in far Western Kentucky began to express interest around that time, but they had a lot of concerns including yield losses, weed control and increased disease and insect pressure.

"No-till wheat was a totally new concept," Murdock said. "Nobody thought it would work, but those growers inspired us to begin research."

Herbek began a study to determine if yields were comparable between no-till and conventional wheat. The results of the study showed they were comparable. However, many growers tried it and didn't like it.

"There weren't really any no-till drills readily capable of planting wheat then," Herbek said.

"And it didn't look really good because it left a lot of skips in the field," Murdock added.

One group that was interested though was the Kentucky Small Grain Growers Association. With their help and financial support, Murdock and Herbek began a long-term research project in 1992 to compare no-till and conventionally tilled wheat in the state's typical two-year, three-crop rotation with corn and double-cropped soybeans. They also studied the things that were restrictive to no-till wheat.

Initial results showed comparable yields. They also showed stand establishment and weed control as two of the biggest restrictions to adopting no-till wheat. The results surprised many in the industry.

"A lot of growers were concerned diseases and insects would be worse with no-till wheat," Herbek said. "But studies conducted by UK entomologist Doug Johnson and Extension Plant Pathologist Don Hershman showed that it wasn't as big a concern as growers expected."

Murdock and Herbek worked to improve stands and residue management. Despite the results and new recommendations, many growers remained hesitant.

Murdock, Herbek and other researchers from the college continued to work and find the benefits of no-till wheat. Over the years, various studies have looked at aspects of no-till wheat including stand improvement, nitrogen management, no-till drill comparisons, water holding capacity and soil erosion. Researchers found no-tillage leads to reduced soil erosion and improved soil quality. In addition, yields for double-crop soybeans and corn can increase when following no-till wheat.

"It's really been a group effort from across the college," Murdock said. "A lot of people have had to believe in this."

Whenever results were available, Herbek and Murdock published and talked about them whenever and wherever they could. Slowly, Kentucky growers began to switch their acreage to no till.

No-till acreage received a boost in 1997 as the result of another UK research project in 1997 funded by the Kentucky Small Grain Growers Association. This study looked at on-farm comparisons of conventional and no-till wheat. Participating growers split a field between the two tillage methods for the study. By the end of the study, most of the participants had completely switched their entire crop to no-till.

"They saw the immediate benefits of no-till including reduced labor, fuel and energy costs," Herbek said.

The second big acreage push came around 2000 when the Kentucky Small Grain Growers Association did a study that suggested the state should increase no-till acreage. The association strengthened its emphasis on no-till wheat, and UK scientists continued to conduct research. In the 2008-2009 growing season, 69 percent of all Kentucky wheat producers planted no-till wheat.

While UK research continues on conventionally tilled wheat, the majority of the college's wheat research focuses on no-till. Data collection continues on the study that began in 1992, possibly making it the longest, continuous, no-till study in the nation.

No-till wheat has spread from the first UKREC test plot to other states and regions including Illinois, southern Indiana and Tennessee. Other states are experimenting with how it fits into their cropping systems.

"I don't know if we can take all the credit for its spread," Murdock said. "There's kind of this idea that the time has come, but our influence has been pretty broad." Δ