

## Researcher says: No-till practices show extended benefits on wheat and forage

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With more than 3 million acres of wheat in north Texas, 50 percent or more of which is grazed by 1 to 2 million head of cattle, it is important to look at tillage practices and their effect on forage production, said a Texas AgriLife Research expert.

Dr. John Sij, AgriLife Research agronomist at Vernon, has been studying nitrogen response and forage production in relation to tillage practices at the nearby Smith-Walker research farm, where grazing research is conducted under commercial conditions.

"When talking about tillage, we have to look at environmental conditions," Sij said, "including frequent droughts, high winds and temperatures, highly erodible soils, low yields, low production inputs, low returns and intense rainfalls."

Conventional tillage can sometimes be excessive and cause moisture loss as well as lower organic matter, he said. Severe wind and water erosion can also occur under conventional tillage, resulting in dust storms and low visibility.

"It is also expensive and time consuming," Sij said. "What you end up with is top soil filling the drainage ditches and the taxpayer has to pay for that to be cleaned out."

The alternative is no-till or reduced tillage, both of which are still being questioned about how well they work, he said.

"There's concern about soil compaction from equipment and grazing, but the soil seems to 'relax' as the year goes on," Sij said.

No-till farming has been termed as more expensive because of less-effective chemical weed-control measures, but that is not true, he said.

"The problem is there is a lack of proper equipment and research to show whether it works," Sij said.

Some other concerns Sij said he has been questioned about are: the need for tillage to kill bugs and reduce disease, compaction and the probability that the roots cannot penetrate the untilled soil, and possible yield decreases.

Producers can actually get earlier grazing under no-till conditions in some years, he said.

"Some of the best stands I saw this year were in no-till because of dry conditions. No-till conserved soil moisture," Sij said.

Overall, he said the benefits of conservation tillage include reduced fuel and labor costs, improved rainfall capture and improved infiltration.

And when figuring the economic difference between conventional tillage and no-till farming in grain-only production systems, the bottom line in the planned returns for 2007-2008 was \$63.22 per acre under conventional tillage compared with \$79.38 per acre under no-till, Sij said. This represents a \$16 advantage for no-till.

"2008-2009 could be different," he said. "It might only be about a \$4 advantage to no-till because glyphosate prices went up."

Sij studied no-till and conventional tillage under a free-range stocker-

cattle situation.

"We didn't have good forage every year," Sij said. "This past year we had little or no forage."

In the study, data were collected on forage production, nitrogen fertilizer effects, grain yield, grain quality and compaction, he said. In dual-use wheat, the plants are clipped monthly to determine yields.

Pre-plant nitrogen rates show almost a linear increase to forage and wheat grain yields, he said. "But you have to be careful – does it pay for itself?" Sij said. "You need some for forage, but there is a fine line. It looks like we need some pre-plant nitrogen for forage production and then apply top-dress fertilizer later to enhance grain yield."

He said producers first need to test for soil nitrate levels within the upper two feet, because it doesn't always get used, especially in a poor crop year.

"Don't assume it is all gone," Sij said. "Take a soil sample and see what is left so you don't have to put on as much expensive nitrogen."

Source: Texas A&M University

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