

Wheat producers advised to take advantage of existing soil nitrogen

September 14 2016, by Kay Ledbetter



New study shows nitrogen in the soil can be credited without hurting wheat yields. Credit: Texas A&M AgriLife photo by Kay Ledbetter

As producers across the state are planting winter wheat, it is important they consider crediting soil nitrogen in their management plans, according to a Texas A&M AgriLife Extension Service specialist.

Dr. Jake Mowrer, AgriLife Extension state [soil](#) fertility specialist in College Station, said [producers](#) can save money in fertilizer costs by taking advantage of existing [soil nitrogen](#) and still make expected yield goals.

Each year producers must determine what and how much nitrogen they will use to fertilize their crop, Mowrer said. His study is determining how [soil testing](#) can help producers know how much nitrates their soil already contains so they can credit that to their overall needs.

He said a study in the Hill Country on the effect of reducing nitrogen fertilizer applications to wheat based on soil test nitrates at depths as great as 3 feet was the first of its kind on a cool-season crop.

Previous studies on warm-season crops such as corn, sorghum and cotton suggest nitrates may be credited to 24 inches without affecting yield, Mowrer said.

"We know that crediting nitrogen fertilizer could save an estimated \$23 per acre for cotton and \$31 per acre on corn and grain sorghum. But what about wheat – how does it respond to this program?"

Working with a producer in Itasca on a project funded through the U.S. Department of Agriculture's Southern Sustainable Agriculture and Research Education, he said their goal was to produce 60-bushel per acre wheat. Soil samples were taken to 48 inches prior to planting in October 2015. The soil is Houston black clay.

Nitrogen from the soil was credited in different plots down to 36 inches.

The wheat was harvested June 10. The full application of nitrogen performed the same as a credit to 6 inches and 12 inches, Mowrer said.

"Our results indicate that yield in wheat was not affected by crediting nitrate-nitrogen in the soil profile to a depth of 12 inches," Mowrer said. "However, yields in this study were adversely affected when fertilizer was reduced by crediting nitrate deeper in the profile."

He said the reason for this may lie in the different efficiencies at which wheat takes up nitrogen already in the soil, as compared to nitrogen that is applied at the surface.

"At 24 and 36 inches, there was a range of 10-60 pounds of nitrogen," Mowrer said. "Surface application of a liquid fertilizer was less efficient than recovery of existing soil nitrate. This result will be explored more closely in the next growing season."

Mowrer said soil fertility is the most limiting factor in plant growth, right after water.

"We know the best you can do productionwise is determined by the amount of water. Nitrogen is the input needed for crops right behind water."

And, he said, the timing of any necessary fertilizer applications once the soil testing is done will affect the growth of wheat.

"We recommend putting out a third of the nitrogen upfront, and then right before jointing put out the other two-thirds," Mowrer said.

"But remember, we can't manage the rate unless we know what is in the soil to begin with," he said. "Voluntary soil testing isn't as widespread as we would like to see it. Soil testing is a really, really important part of

managing our nutrients, particularly for nitrogen."

Mowrer said his recommendation is to put about 1.5 pounds of nitrogen for grain production or 2 pounds per acre of nitrogen for grass.

"If there is some nitrogen in the soil, we can adjust that rate," he said.

"But you don't know what is there unless you test it. We recommend you can credit what you find all the way down to 2 foot."

Another study he is working on is examining the different root systems to see if they make a difference in what nitrogen can be utilized, as well as determining if types of soils matter.

Following up on the results in the previous year's wheat study will be a top priority in the coming season, Mowrer said.

"Although topdressing with surface applications is the recommended procedure for [wheat](#) at jointing, there are new technologies for fertilizer delivery that may hold the potential for increased [nitrogen](#)-use efficiency over what we see today with stream bars and tips."

Provided by Texas A&M University

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