

AgriLife NEWS

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Study reveals Texas cotton producers should apply less fertilizer in certain cases

By: **Blair Fannin**, 979-845-2259

Contact(s): Dr. Frank Hons, 979-845-3477, f-hons@tamu.edu



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COLLEGE STATION – Texas cotton producers may be using too much of a good thing when it comes to fertilizer.

A three-year study by Texas AgriLife Research found producers should test soil nitrate levels to a depth of at least 18 inches or more rather than a previously recommended 6 inches.

The new recommendation comes after research revealed high levels of nitrogen found in deeper soil depths. Researchers also found cotton is able to utilize these nutrients throughout the growing season. The findings could lead to more than \$50 million in savings for Texas farmers and reduce the threat of leaching to groundwater.

“That doesn’t include other costs such as extra spraying for insects, defoliation, harvesting and other expenditures associated with rank or excessive growth,” said Dr. Frank Hons, an AgriLife Research scientist who led a study team.

The research, funded by Cotton Inc., took place at the Texas AgriLife Research Farm in the Brazos bottom region of Burleson County. The fertilizer was applied at various depths down to 42 inches using a hydraulic soil probe in micro plots measuring 4 feet long by about 7 feet wide.

“We would take a core sample every 8 inches of the two rows of the micro plot,” Hons said. “We would take a core sample down to the appropriate depth, then take N-15 (nitrogen used frequently in agricultural research) solution liquid and inject at that depth and refill the hole. The N-15 allowed us to distinguish fertilizer uptake as compared to nitrogen already present in the soil.”

Researchers would examine the different growth stages of the cotton through the season, analyzing dry matter partitioning, plant height and other aspects.

“Then we came back and harvested plants, dried them and ground them up so that we could analyze for total N and N-15 concentrations in the plants,” he said.

They found during the first sampling, which was at mid-bloom, that cotton plants were taking up nitrogen to a depth of at least 24 inches. Another sampling was taken close to harvest around mid-July.

“We found cotton plants were able to use available nitrogen down to at least 42 inches,” Hons said.

Common cotton varieties were used as part of the field studies, Hons said. The data indicates a cotton farmer may need only 40 to 45 pounds of nitrogen per bale instead of the 50 pounds recommended in the past.

“The thing that surprised me the most (about the findings) was how rapidly cotton could remove nitrogen from deeper depths of the soil,” Hons said. “This and associated studies indicate that in certain instances we may have been over-fertilizing portions of Texas cotton, adding more fertilizer than the plant actually needs.”

And there has already been positive feedback from producers, who experienced record-high fertilizer costs in 2007 and 2008 as part of the energy crisis in the U.S.

“What I’ve heard overall is that the research has been well-received,” Hons said. “Farmers see it as an opportunity to cut their costs and improve their bottom line.”

Editor’s note: The following can be used as a breakout box:

AT A GLANCE:

- Cotton is a major Texas cash crop with farmgate value of \$2.1 billion and approximately 4.7 million upland acres harvested in 2007.**
- Nitrogen management is critical to the bottom line of Texas cotton farmers.**

- Texas AgriLife Research found tests for residual soil nitrate should be done at depths 18 inches and below, rather than the previously recommended 6-inch interval.
- The three-year study was funded by Cotton Inc.

-30-

AgriLife Communications

1501 Texas Avenue South | 2112 TAMU | College Station, TX 77843 | [Map](#)
Phone: (979) 845-2211 | Fax: (979) 845-2414 | Email: AgriLifeWeb@tamu.edu

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